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ORIGINAL ARTICLES.

THE DIAGNOSIS AND SURGICAL TREATMENT OF MALIGNANT OBSTRUCTION OF THE PYLORUS.

WITH REPORT OF THREE PYLORECTOMIES AND FOUR GASTRO-ENTEROSTOMIES.

Presented to the Section on Surgery and Anatomy, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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The stomach is undoubtedly the most common seat of carcinoma. Hartley, in a recent paper on "The Etiology of Tumors" before the New York Surgical Society, says that not less than 34.97 per cent. of all carcinomata are to be found in the stomach, and points out clearly the relation between the chronic irritation to which the stomach is subjected, and the disease.

Gussenbauer and Winiwarter estimate that more than 60 per cent. of stomach cancers are at the pylorus and according to Bull, in more than one-half of these cases, the mechanical obstruction causes death before glandular infection takes place or the infiltration of neighboring structures is far advanced.

Senn, in his monumental work on "Tumors," says that the histologic structure of cancer of this organ mimics the tubular glands, while the character of the tumor is determined by the relative amount of epithelial cells to the stroma. This is well shown by the clinical history of the case. If the cell structure is in excess, the growth is active, ulcerates early, and glandular infection occurs so quickly that the diagnosis will seldom be made in time to be of value. In this class of cases, complete gastrectomy would be the only procedure indicated, as there will seldom be marked obstructive symptoms requiring gastro-enterostomy for relief. The successful case of Schlatter is hardly sufficient to give the operation a permanent position, nor can the curetting of the growth through a gastrotomy incision, as practiced by Bernays, be greatly commended as a palliative measure.

That variety of carcinoma of the pylorus in which the stroma is in excess, quickly produces obstructive symptoms which lead to a diagnosis, and the nature of the tumor does not favor early glandular infection. These growths are often annular in form, greatly resembling the carcinomatous stricture commonly met with in the colon. Rarely the infiltration may involve the whole of the stomach, without special contraction of the pylorus, the walls being of enormous thickness and the cavity small, the latter a point of diagnostic importance, as the great thickness of the stomach wall resembles that due to pyloric obstruction with consequent dilatation. Hektoen recently exhibited two marked specimens of general gastric cancer before the Chicago Medical Society. The large fibrous stricture of the pylorus described by Greig Smith as probably non-malignant, greatly resembles general gastric carcinosis. Sections showing malignancy are difficult to obtain in both instances. Maylard, in speaking of this variety of obstruction, says that in the latter stages glandular infection takes place and the histologic structure of the adenopathy is typically carcinomatous.

The enormous hypertrophy of the walls of the pylorus may form a distinct tumor, and these cases have usually been treated by gastro-enterostomy, particularly by Doyen.

I have met with one well-marked example of this so-called large fibrous stricture of the pylorus which had well defined limits. If these cases are malignant, pylorectomy is indicated; this was the view I took of it and acted accordingly. Clinical experience will soon demonstrate the question as to whether they are cancerous or not.

Rokitansky long ago pointed out that extension of any form of stomach cancer to the duodenum seldom took place. Sutton describes an adenoma as a rather infrequent tumor of the pylorus, which may be obstructive in its nature and possibly become malignant. Sarcoma of this region is so rare as to be a pathologic curiosity, and need not be dwelt upon here.

The diagnosis of obstruction of the pylorus and resulting dilatation of the stomach is not difficult. Senn teaches us that when the fundus lies below the level of the umbilicus, there is pathologic dilatation unless gastroptosis is present. Inspection of the abdomen in marked cases will often reveal the outlines of the stomach, and if it be distended, succussion will produce splashing sounds. It is a simple expedient in the diagnosis of dilatation to pass a stomach tube and inflate the cavity with atmospheric air by means of a valve syringe, making its outlines evident, overdistension relieving itself around the tube.

The normal stomach, as shown by Haslam, is contracted, and its walls in apposition or in close contact with ingesta. The differential diagnosis as to the malignant or non-malignant character of the obstruction is often difficult and occasionally impossible without incision of the abdominal walls. The history is of the utmost importance. A long history and a slow indefinite course in the early stages is against cancer, and in the stenosis due to scar contraction, an early history of frequent painful vomiting, especially after taking food, and the other classic symptoms of previous ulceration, are often brought out.

In cancer the onset may be insidious, but is limited to a few weeks or months, rather than years. In the latter stages the vomiting of great quantities of partly digested food at intervals is indicative of the dilatation, but has little differential value as between malignant and non-malignant obstruction.

The presence or absence of a tumor has some sig-

nificance in connection with the history. In eleven cases of non-malignant obstruction, three had a well-marked tumor of the pylorus due to a thickened board-like scar, while in seven cases of cancer operated upon, in three no enlargement could be felt. A tumor with a short history, accompanied by a cachexia, which while not peculiar to cancer, is of such frequent occurrence as to be clinically called "cancerous cachexia," is of great diagnostic importance.

What shall be said as to the absence of free hydrochloric acid, or presence of lactic acid, in the differentiation? Dr. Christopher Graham has made systematic examination of such cases as have been admitted to St. Mary's Hospital for four years. In cancer, the absence of free hydrochloric acid has been the rule, but has occasionally been absent in the late stages of non-malignant obstruction. On the whole, the chemic tests have been disappointing. The presence or absence of lactic acid varied in the same case at different tests, while the iodid test for absorption and salol test for motor power added little to knowledge more reliably furnished by clinical methods in common use. The gastroscope and the gastrodiaphranoscope do not give encouraging results, even in the hands of their advocates. The X-ray adds little to the diagnosis, although, as shown by the cases of Meisenbach and others, it is of the greatest value if foreign bodies are contained in the stomach. After all, of what great value is the preliminary exact diagnosis in cases of marked pyloric obstruction, as, under any circumstances, surgical intervention is necessary, and the earlier it is instituted the better will be the results, and as Haslam says, it may be impossible with the growth in hand to tell a hard carcinoma from a fibrous stricture, or a beginning cancerous degeneration of the scar of former ulceration. Other things being equal, an early diagnostic incision, to be extended if feasible into therapeutic measures, should be the rule.

In seven cases of malignant disease, which I have explored, nothing further was done. In two of these cases great improvement followed, in one case lasting for a year. Tait, long ago, called attention to the good effect upon intra-abdominal malignant disease the mere incision of the peritoneum occasionally had.

Upon opening the abdomen the cancerous nature of the disease can usually be readily recognized by the enlarged tortorous vessels in the peritoneal covering, so different from the whitish scars of former ulceration. The nature of the so-called large fibrous stricture, upon which Loretta first performed his operation of digital divulsion is in doubt. Whether the exploration shall end as such or be converted into the first step of a pylorectomy or of a gastro-enterostomy, will depend upon the extent and character of the disease, the adhesions to surrounding viscera, and the condition of the glands.

The non-operative treatment consists of careful regulation of the diet and the use of bismuth, salol and gastro-intestinal antiseptics of this class to relieve the attendant catarrh. The late Dr. David Collins of Minnesota thought the internal administration of one grain of methyl blue, with three grains of powdered nutmeg after eating, was of great benefit. Ochsner, in hopeless cases, practices the routine use of the stomach tube twice a day for the removal of the unabsorbed remains of ingesta to prevent irritation.

There are but two operative procedures which can claim serious attention: pylorectomy, a radical operation based on the hope of a cure, and gastro-enterostomy, for palliative purpases.

Pylorectomy is not a popular operation, its great immediate mortality, 40 to 70 per cent., and the few cases which have survived the three-year time limit have been discouraging, but if it is a fact that 50 per cent. of pyloric obstruction cases die before systemic infection takes place, an early operation should give better results. Bernay takes the view that the operation is useless unless we take out the entire stomach, seeming to class it with cancer of the breast or uterus, yet in cancer of the colon, which appears often as a stricture and produces an obstruction, mechanical in its nature, he would hardly hold the analogy complete and advise the removal of the entire large bowel.

When the whole question is opened it would seem that the enormous mortality has really been the objection, and the only cases which have appeared to justify the risk, have passed beyond cure. Improvements in technique will soon remove much of this fear. Kocker has had seven recoveries out of nine cases; Pean eight recoveries out of twelve cases. One cause of the great mortality in the so-called Billroth method was imperfect union and resulting leakage at the suture angle, that is, at the point where the narrowed stomach was fitted to the duodenum.

The performance of pylorectomy, and either side to end gastroduodenostomy or side to side gastrojejunostomy has remedied this weak point in the older technique and is now usually employed by the continental surgeons. Of these two later methods, gastroduodenostomy is the operation of choice, as one of the constant dangers of gastrojejunostomy is the so-called regurgitant vomiting, the bile and the pancreatic juices passing into the stomach through the fistulas opening, rather than along the intestinal tract. I quote in full from a paper which I read before the Minnesota Academy of Medicine, Feb. 2, 1898, and published in the *Medical Record* for June 11, 1898, a description of an operation for removing the pylorus and part of the stomach, which has been successfully employed by myself and my brother, Dr. C. H. Mayo, on three occasions.

These cases all recovered from the operation, and while now in good condition, sufficient time has not elapsed to speak of them as cured. The method of pylorectomy we have followed has been so speedy and satisfactory that I would like to call your attention to it. The ease with which any desired amount of stomach can be excised is especially noticeable; in one case the upper suture angle lying behind the left costal arch in close proximity to the cardiac orifice, passing obliquely downward and to the right more than six inches in length, making a sort of shovel nose to the amputated end.

I make no claim to originality, although I know of no method of equal simplicity, and in the cases referred to, and also in a number of cadaver operations, the details were readily carried out. The steps are as follows:

1. A median incision above the umbilicus and, if needed, a cross-cut of the rectus.

2. Double ligation and division of the necessary amount of gastrohepatic omentum; this allows the pylorus and lesser curvature to be delivered. The fingers are now in the lesser cavity of the peritoneum and at once slip under the pylorus and act as a guide to the careful double ligation and division of the gastrocolic omentum attached to the malignant area.

3. The diseased part is isolated by a piece of gauze drawn under it and a pair of forceps are caught from each side, separating the diseased from the healthy stomach and also preventing leakage from below. With a knife make a circular cut completely around the healthy portion of the stomach to the mucous coat. The muscular and peritoneal coats are stripped back and a few bleeding points caught with forceps. The mucous coat is cut inch by inch and at once closed by a continuous catgut suture; this is cut short and the detached pylorus and tumor is covered and turned out of the way. A second continuous catgut suture of the muscular coat rolls in the mucous, while outside of this, a good silk Lembert of the peritoneum and muscular coats protects and rolls in the two first rows of sutures.

4. The end of the stomach is slipped to the right and the ends of the tied omentum are sutured to each other and to the suture line, not only making further protection, but also anchoring the stomach to the right and preventing undue traction upon the duodenum after it is fastened in place.

5. The duodenum is cleanly amputated at a healthy point and buttoned with a Murphy button to the anterior lower wall of the stomach (at least three inches from the suture line, see Case 3).

We have made this operation once in forty-five minutes, once in one hour and five minutes, once in one hour and twenty-five minutes. I mean by this, from the time the operation is commenced until the dressings are in place, and in each case from four to six and one-half inches of the stomach have been excised.

In the appendix to this paper will be found the detailed histories of these cases. The operation herein described is a modification of the one published by Murphy in the London *Lancet* in 1895, and to him is due the credit of first clearly directing attention to the value of the combined operation.

Gastro-enterostomy, or the operation of Wolfler, is a much more popular procedure than pylorectomy, although in performing it we frankly accept the inevitable. This operation has been so thoroughly discussed recently by Willy Meyer in the *Annals of Surgery* for July, 1897, and by Dr. Robert Weir in the *Medical Record* for April 16, 1898, that I will not take up much of your valuable time with it.

At present there are but two methods of gastro-enterostomy which have a considerable following: the suture operation and that with the Murphy button. I recently had the privilege of witnessing the distinguished surgeon, Professor Senn, do the suture operation. In his hands it seemed easy and was certainly rapid and satisfactory. I have made ten gastro-enterostomies, four only for malignant disease, with one death. All of my operations have been with the Murphy button, and I have had no cases of regurgitant vomiting nor of recontraction. One non-malignant case now of over three years' standing.

The collection of cases reported by Meyer and Weir show the great frequency and fatal character of the regurgitant vomit, and the importance of the subject is shown by the numerous methods of preventing its occurrence by Kocher, Doyen, Braun and others. From a careful study of histories of the fatal cases in which this has happened, I believe it to be less common with the button than with the suture. The method of gastrojejunostomy I have followed has been to grasp the jejunum at its origin and form a coil which shall be sufficiently free to attach to the anterior wall of the stomach without dragging, using no sutures whatever.

As the stomach wall is very thick, it should be cut to the mucous coat before the puckering string for the button is put in, and the bite of the suture in the stomach wall should not be great, to prevent the button remaining too long in place. It occasionally happens that the button will drop back into the stomach. In the reported cases of this accident it has caused no harm and not infrequently it has been voided weeks or months after the patient has passed out of observation.

I think too much importance has been attached to the question of whether the bowel shall be fixed to the anterior or posterior wall of the stomach; the results seems to be about the same in either case. At the present time I believe the results, both immediate and remote, with the button are better than with the suture.

A few words in regard to the preparation of the case for operation upon the stomach. It has been my experience that the preliminary cleansing and emptying has been less perfect than would appear reasonable to expect, and at the operation a stomach apparently empty before will be found to contain a considerable amount of material, and as this viscus is elevated outside of the abdominal incision during the operation this fluid may gravitate into the dependent esophagus and be aspirated into the lungs, causing a fatal septic pneumonia. Great care on the part of the anesthetizer is necessary in these cases to prevent this accident.

Case 1. Cancer of the pylorus: pylorectomy and gastroduodenostomy.—B. McD., female, aged 61 years; Irish; admitted to St. Mary's Hospital, Rochester, Minn., Sept. 22, 1897, giving a history of an obscure stomach difficulty which had existed for several years past. Within the previous six months the character of the distress had changed, was accompanied by vomiting at irregular intervals of large quantities of decomposed food. There had been twenty-five pounds loss of weight. Physical examination.—Patient somewhat emaciated, no tumor could be discovered; stomach greatly dilated; no free hydrochloric acid. Operation Oct. 1, 1897. A carcinomatous contraction of the pylorous was found, no glandular enlargement. Pylorectomy and gastroduodenostomy. Button passed on the seventeenth day. Discharged Nov. 30, 1897.

Case 2. Cancer of the pylorus: pylorectomy, partial gastrectomy and gastroduodenostomy.—P. D., female, aged 54 years; Irish; admitted to St. Mary's Hospital, Rochester, Minn., Nov. 8, 1897, with a history of gastric symptoms extending over a period of several months. For the past two months she has vomited large quantities of partially digested or decomposing food, once or twice in twenty-four hours and has grown weaker, with a loss of about fifty pounds in weight. Physical examination.—Patient emaciated, face drawn and haggard in appearance; lungs and heart in good condition; urine contains one-fourth of one per cent. of albumin, no casts. A large quantity of decomposing food material was removed with the stomach tube; through the tube the stomach was distended with air and and its lower border shown to be three inches below the umbilicus. An obscure tumor could be felt in the epigastrium; no free hydrocloric acid present in the stomach contents. Operation Nov. 25, 1897. A carcinomatous stricture of the pylorus was found, the infiltration extending along the lesser curvature to a point three inches from the cardiac orifice. No apparent glandular enlargement. Pylorectomy, partial gastrectomy (one-third of the stomach) and gastroduodenostomy. Button passed on the sixteenth day. Discharged Dec. 23, 1897.

Case 3. Cancer of the pylorus: pylorectomy and gastroduodenostomy.—M. T., male, aged 42 years, German; admitted to St. Mary's Hospital Jan. 3, 1898, with a history of gradually increasing stomach trouble during the past three years. He has been unable to eat solid food for nine months, vomiting the greater part of the nourishment taken at irregular intervals, and within a month has had two attacks of apparent complete pyloric obstruction, each lasting three or four days and accompanied by great prostration. Physical examination.—Patient

extremely emaciated, no tumor, stomach enormously dilated and partly full, the lower border apparently resting on the pelvic brim; no free hydrochloric acid. Operation Jan. 5, 1898. The so-called large fibrous hypertrophy of the pylorus was found. Obstruction almost complete. Pylorectomy and gastroduodenostomy. It was noted after the anastomosis was effected that the opening was rather too close to the suture line, but as the patient was in bad condition it was not corrected. Button passed on the twenty-first day. Patient discharged Jan. 31, 1898. Six weeks later, having up to that time gained thirty-two pounds in weight, patient was suddenly seized with symptoms of acute pyloric obstruction. His condition rapidly became worse, and in three weeks the man was reduced to a remarkable degree, the emaciation being beyond anything I have seen. As he was unable to return to the hospital, I proceeded to his home at Kasson, Minn., where I found him confined to his bed and partly delirious from starvation. With the help of my brother, Dr. C. H. Mayo and Drs. Bedient and VanCleve of Kasson I made a gastrojejunostomy. No attempt was made to ascertain the cause of the recent obstruction on account of his weak condition. For two weeks following the patient remained in a precarious condition, from which time his recovery was rapid, and in two months he had gained forty-two pounds and is now apparently well and of greater weight than ever before.

Case 4. Cancer of the pylorus; gastro-enterostomy.—A. A., male, aged 70 years, Norwegian; admitted to St. Mary's Hospital Aug. 2, 1894. Gastrojejunostomy for malignant pyloric obstruction. Death on the fourteenth day from aspiration pneumonia. Postmortem showed union complete; button in the stomach. Case reported in *Annals of Surgery* for 1895.

Case 5. Cancer of the pylorus; gastro-enterostomy.—J. K., male, aged 58 years, German; admittted to St. Mary's Hospital March 5, 1895. Gastrojejunostomy for malignant pyloric obstruction March 8, 1895. Button passed on the twentieth day. Discharged April 5, 1895. Remained in good health for thirteen months, then died from rapid return of disease.

Case 6. Cancer of the pylorus; gastro-enterostomy.—D. D., male, aged 60 years, Welsh; admitted to St. Mary's Hospital June 30, 1896. Gastrojejunostomy July 2, 1896, for obstructive cancer of the pylorus. Button passed the eleventh day. Discharged July 18, 1896. Lived for more than one year in comparative comfort before death from extension of the disease.

Case 7. Cancer of the pylorus; gastro-enterostomy.—M. T., male, aged 42 years, German; Feb. 26, 1898. Gastrojejunostomy for acute pyloric obstruction six weeks after pylorectomy for malignant disease (see Case 3). Button not passed, so far as is known. Patient now, three months after, has gained fifty-two pounds in weight and is in fine condition.

DISCUSSION.

Dr. J. B. MURPHY of Chicago—I have been much pleased with the emphasis laid by the essayist upon the importance of early exploratory operation in these cases and consider this one of the most important points in the paper. I would like to compliment the author upon the energetic manner with which he has pursued his ideas. I have made a number of exploratory operations in order to determine the diagnosis. If we are to have good results and permanent cures, which I believe we should have just as in cases of removal of the cervix for carcinoma, in the early stage, it is proper to make an early exploratory incision for the exposure and examination of the pylorus, a procedure involving a risk of less than 1 per cent. When one considers the number of cases that occur every day in practice, we are justified in taking these chances, and the time will come when we are obligated to make an exploratory incision and not allow the large number of cases of malignant stenosis of the pylorus to go on to a fatal termination as we do now. The method of drawing forward the pylorus is important, and enables us to bring it immediately out of the abdomen, and facilitates the operation. Gastro-enterostomy has become a well-recognized procedure and has much to recommend it. When a surgeon performs this operation he has rarely seen the case from the beginning, and when a medical man refers the case to the surgeon for gastro enterostomy the patient has usually been allowed to pass beyond the line of the preservation of his life and is sent to the surgeon for operation so that he may die easy. If you let carcinoma of the cervix go on a certain time hysterectomy will be useless. In the pylorus, however, a longer time usually elapses after operation before secondary infection occurs. It makes the obligation to operate greater, because the symptoms exist for a more prolonged period and we should not be compelled to do gastro-enterostomy at such late days.

Dr. MCARTHUR of Chicago—We might reverse the method in making a gastro enterostomy prior to the removal of the carcinomatous or constricted pylorus. If a passage were to be provided prior to the removal of the pylorus, the patient could better stand an operation later for the removal of the stomach.

Dr. JOHN B. HAMILTON of Chicago—Three years ago a case came under my observation, when I acted from similar motives to those contained in Dr. Mayo's suggestion, and the patient is still living. She was at that time 30 years of age, had vomiting, was greatly emaciated, weighed only about ninety pounds and could retain nothing in the stomach. Malignant disease of the pylorus was suspected, but no hemorrhage was present; an exploratory incision was made. When I opened the abdomen I found no glandular involvment, but there was great enlargement of the duodenum at the pylorus. I opened the stomach and passed my finger into the pylorus and examined it. I found that it yielded to the finger pressure and then inserted one, two and three fingers so as to forcibly dilate it, thus performing Loretta's operation. Finding that I now had a free opening and believing the case to be non-malignant I closed the stomach wound in the ordinary way. The woman today weighs about one hundred and forty pounds.

INTESTINAL ANASTOMOSIS BY A NEW METHOD.

Presented to the Section on Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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DETROIT, MICH.

Since Lembert, about 1825, asserted that the union of serous surfaces was to be aimed at in intestinal anastomosis, many methods of suturing have been introduced and many mechanical substances used to facilitate the suturing, but no appliance has yet been invented in the use of which the union should not be fortified by suture. This being true, if device is to be used, it should possess the following qualifications: 1, it should be rigid so as to hold the parts firmly in apposition; 2, it should, as soon as its function is performed, as soon as the suturing is done, pass quickly away to leave the lumen of the gut free; 3, it should be easy of introduction.

In gastrectomies upon dogs I found it difficult to make a satisfactory union between the intestine and esophagus. This led me to experiment with various appliances to facilitate suturing. When I decided to use sugar I had cylinders of hard candy prepared around which I filed grooves. This made them easily broken at the line of filing. To overcome this objection I had molds prepared in which to run the sugar. Many different sizes being needed, a consideration of expense led me to adopt the following method of preparation.

Cylinders of sugar are prepared carefully so as to exclude the presence of air spaces. These cylinders vary in size by the eighth of an inch, the smallest being one-half inch in diameter. By the aid of a file they are broken into pieces, one and one-half inches long. Around the center of each piece a groove is burned by a screwdriver one-eighth of an inch wide. The ends are rendered cone-shaped by the same instrument and smoothed by moistened fingers. They are then dried and wrapped in oiled paper to keep them from long exposure to the air. This device enabled me to make the union of the intestine and esophagus in less time and more satisfactorily than was possible by either the bone or metal buttons, or by unaided suturing. I then began its use in intestinal anastomoses with results that were satisfactory except for the fact that numerous adhesions would occur between the line of union and mesentery, liver, parietal peritoneum and other loops of intestine. The first four

specimens presented are samples of these adhesions. Baum's recommendation to apply to the line of union absorbable tissue is obviously wrong. I proved this to my own satisfaction, however, by careful experimentation with the application of gold-beaters' skin and the fibrous coats of stomachs and bladders. In all cases operated upon by various methods the autopsies showed one condition ever present, that the omentum became adherent to every accessible point of wounded tissue. This observation led me to direct the efforts of nature by wrapping a fold of the omentum around the gut at the point of union. This I found prevented

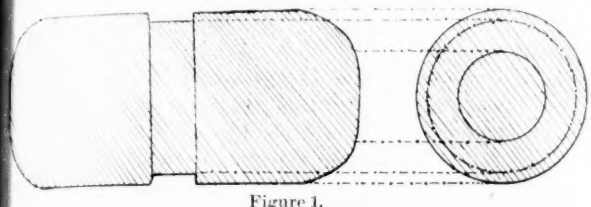

Figure 1.

adhesion in nearly every case, as the remaining specimens show. I knew at the time that Dr. Senn recommended the use of omental grafts and afterward learned that Dr. Theodore A. McGraw had protected his line of suture in the large intestine by covering it with a fold of omentum. Leaving the blood supply of the omentum undisturbed I consider a valuable feature of the method.

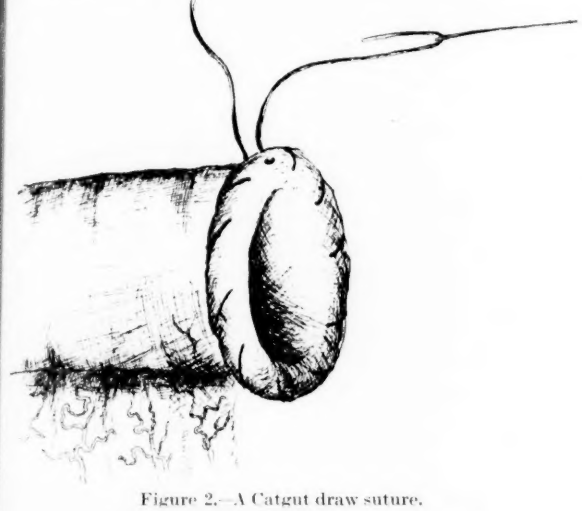

Figure 2.—A Catgut draw suture.

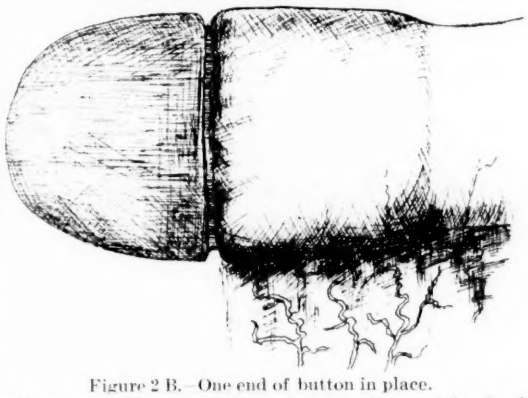

Figure 2 B.—One end of button in place.

I will now call your attention to the method of applying the sugar approximator. (Fig. 1.) In end-to-end anastomosis, a spiral suture of carbolized catgut is passed as shown in A of Fig. 2 to bring the edges of all the coats of the gut together to the bottom of the groove shown in B. The size of the approximator should be such that its insertion will necessitate a slight stretching of the gut. To do this without crushing the tissues, I have had made the forceps as shown in Fig. 3. Their importance is enhanced by the fact that temporary spasmodic stricture occurs near the line of section. Insertion of the other end into the gut is made in the same manner, the spiral suture tied, when the ends will appear in apposition as in Fig. 4. The groove should be shallow, to permit the placing of the first line of suture as near the edge of the serous coat as possible. I use fine braided silk. The next suture is placed in the same manner

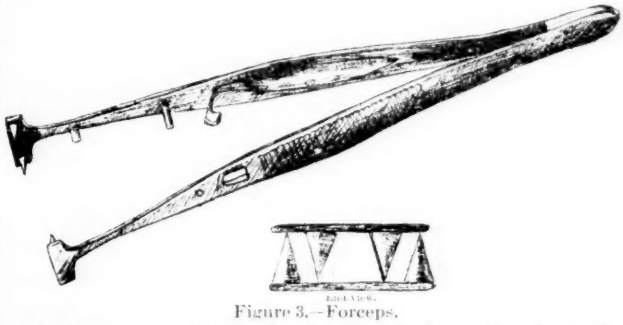

Figure 3.—Forceps.

and about one-sixteenth of an inch from the first, the gut slipping easily over the cylinder to permit accurate co-aptation Fig. 5 represents a longitudinal section showing sutures tightened and approximator in place. Fig. 4, omitting the red line of suture, presents the appearance of the completed union.

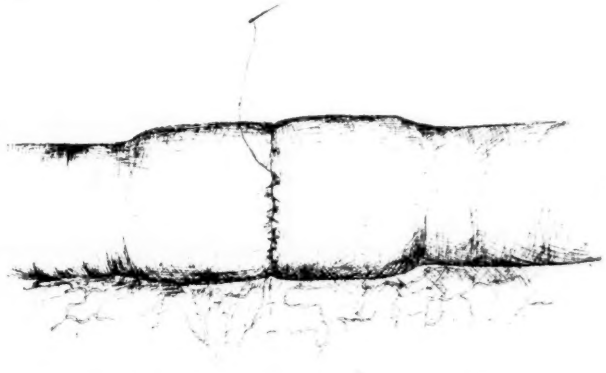

Figure 4.—Ends approximated, showing placing of first suture.

The subsequent narrowing of the lumen of the gut depends upon the extent of union of the serous surfaces, the extent of this union governing the amount of fibrous tissue formed, to which the subsequent contraction is due. In order to show you the extent of contraction in any case, it would be necessary to permit the animal to live several months and present a

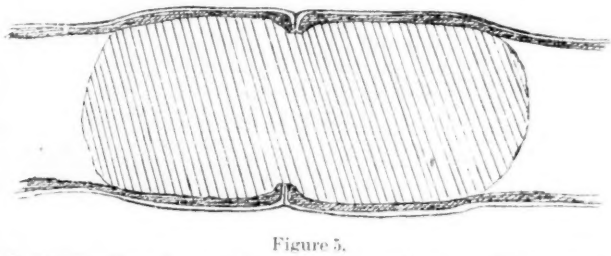

Figure 5.

photograph of a microscopic section. This, time would not permit me to do on this occasion. Specimen No. 9 is one showing lines of suture too far apart, that is, the union of too great an extent of serous surfaces. The operation is completed by wrapping a fold of omentum around the line of union and secur-

ing it by one stitch at the mesenteric border. Lateral anastomosis may be done in substantially the same manner.

The advantages of the method are: 1, the approximator will quickly disappear and will therefore give no future anxiety; 2, with the approximator in place the mesentery may be accurately adjusted by rotating before suturing; 3, the ease and rapidity with which the union can be effected (Specimen 8 shows one removed from a dog upon which I operated without assistance); 4, the ease, rapidity and cheapness of manufacture of the approximator; 5, the spiral catgut stitch uniting the edges of the coats, tends to prevent accumulation of fluid and formation of abscess beneath the mucous coat; 6, a doctor of average surgical ability can perform the operation when emergency demands.

DISCUSSION.

Dr. H. H. GRANT of Louisville—I have done several of these operation both anatomically and surgically, and have gotten along as well without artificial aid as with it. The device suggested is a slight modification of the one we are familiar with, merely using a potato or turnip and preparing it just before the operation. The device facilitates the operation in the hands of those who have had little experience in the handling of the needle but the time occupied is not much less than a skilled operator would employ without much aid. If we must use a mechanical device we should employ the Murphy button. It is true that failure has occasionally resulted from imperfect approximation of the surfaces with the Murphy button, but this results largely from a want of familiarity with the mechanism of the button. If the serous surfaces are brought accurately together, the necessity for the use of sutures will rarely occur. The employment of these devices takes time and adds to the risk of hemorrhage. There is very little to do in securing apposition of the surfaces other than that which nature will take care of, and I question whether it will be to the interest of the profession to substitute anything for the Murphy button which can usually be dispensed with.

Dr. METCALF, in closing: I agree with the gentleman who has discussed my paper that it is an easy thing to do an intestinal anastomosis, but it is not easy at times to make the anastomoses that we are called upon to do. My experience is that I can do the operation in one-half the time that I used to be able to do it, and in such a way that there will be less serous surface to approximate. The results will be more accurate and the subsequent contraction less."

THE ADVANTAGES OF A PERMANENT ABDOMINAL ANUS AND OF TOTAL CLOSURE OF THE SACRAL END OF THE RECTUM, IN OPERATIONS FOR CANCER OF THE RECTUM.

Presented to the Section of Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY W. W. KEEN, M.D.,

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In the *Therapeutic Gazette* for May, 1897, I published fifteen cases of amputation of the rectum by Kraske's method, to which I have since added two more, making seventeen in all. Three of the patients died, giving a mortality of 17.07 per cent. Of the fourteen cases that have recovered, six have now passed beyond the three-year limit and may be considered reasonably safe from recurrence. Two of the men, in spite of the loss of the coccyx and part of the sacrum, ride bicycles with ease. Besides these the paper included a number of other cases of cancer of the rectum, operated on by other methods.

As a result of my experience in these cases, I have reached a definite conclusion as to what is the best course to pursue. Evidently after the operation the bowel must continue to be emptied of its contents. There are only three ways in which this can be done. First, in those rather rare cases in which the sphincter can be preserved and the lower end of the bowel sutured to the upper, *i. e.*, a resection rather than an amputation of the rectum we restore the natural function of the bowel through the normal anus. Second, if the anus and sphincter have had to be removed we can suture the sacral end of the rectum at the end of the resected sacrum, pass it through the gluteal fibers and make an artificial sphincter, or rotate it to such an extent as to make a sort of supplementary sphincter. I have not tried bringing the end of the rectum out through the fibers of the gluteus maximus muscle. Both of the other methods I have tried, but

Figure 1.—The inguinal anus in Case 1.

neither has proved satisfactory. Rotation of the bowel has been followed by infection in the folds of the rectum and not very satisfactory results as to retention of feces. The sacral anus has not been satisfactory, first because it necessitates the patient's wearing for the remainder of his life, day and night, a napkin, partly on account of the constant escape of mucus, and partly on account of the want of control of the feces. In addition to this, there has always followed a greater or less prolapse of the bowel, which in some cases even reached six inches. No perineal napkin can be worn tight enough to produce pressure sufficient to prevent either of these annoyances.

Besides the annoyance of wearing a napkin, the involuntary escape of mucus and feces and prolapse of the bowel, the sacral anus has another danger at

the time of operation and afterward, namely, infection of the wound. This infection is due partly to the fact that the bowel can not be suitably evacuated, nor can it be disinfected before the operation by means of the natural anus. The cancer forms such an obstruction that neither can the feces escape downward, nor can satisfactory cleansing of the bowel be accomplished by means of enemata. After the operation also the danger of infection from the escaping feces is a constant menace to the success of the operation. I have therefore in my later operations always made a preliminary colostomy by Maydl's method. At the end of about a week, I have excised all of the protruding portion of the bowel, leaving a permanent artificial anus. The advantages of this are, first, that before the operation one can empty the upper bowel completely, and disinfect the lower bowel partly through the natural and partly through the artificial

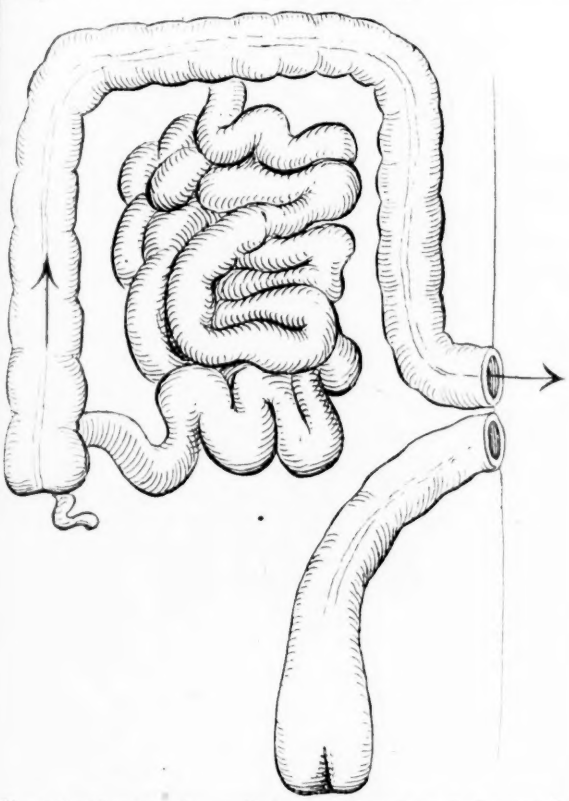

Figure 2.—Showing the preliminary colostomy and the complete closure of the sacral end of the rectum after amputation.

anus. In the paper already alluded to, I have shown the impossibility of disinfecting or even of unloading the bowel prior to amputation of the rectum, even after days or weeks of effort. Secondly, an abdominal artificial anus is very much more under control, and can be cleansed very much better than a sacral anus. One can wear a belt or girdle as tight as is necessary, both to prevent undue protrusion and to prevent the escape of the feces. Figure 1 shows the result in one of my recent cases. Prolapse is present to a slight degree, but does not annoy the patient. He is a blacksmith and does his work perfectly well. Most of the cases with such an artificial anus have the bowel emptied spontaneously, once, or more commonly twice, a day, and at almost as regular hours as by the normal rectum. Of course when there is diarrhœa no control over the evacuation remains, but as I have shown in my previous paper, by means of a suitable dressing, the contents of the colon, as they escape, are caught and are prevented from becoming a source of annoyance to the patient or those about him.

In the last two cases upon which I have operated, I have taken a further step which I think is a distinct improvement in rectal surgery, namely: after amputation of the rectum, I have completely closed the sacral end of the rectum, just as one closes the end of the intestine before making a lateral anastomosis (Figure 2). The first advantage of this is that if the closure is a success, neither fecal matter nor infected mucus can reach the wound, and we are much more likely to obtain primary union, which greatly lessens the danger of life. Secondly, as the perineal wound is entirely closed, no escape of either feces or mucus occurs after recovery and the patient is relieved of the necessity of wearing a napkin. Thirdly, for the same reasons, we avoid any prolapse.

I have carried out this plan in two cases. I was not able to avoid infection, because in the first cases there was slight leakage, and in the second there was an unavoidable dead space left at the end of the

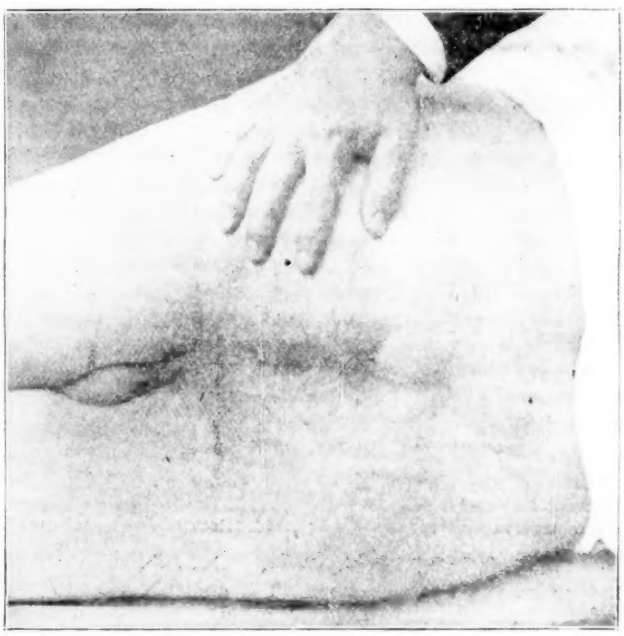

Figure 3.—Complete closure of the perineum without any sacral anus after amputation of the rectum.

sacrum, and a slight reactionary hemorrhage. But both of these cases suffered far less from febrile reaction than I have seen after the more severe infection by ordinary methods; and both have made excellent recoveries. The second case is too recent to express an opinion as to the functional results. These, in the first case, could not be better. Seven months have passed since this operation and his physician, Dr. Bashore of Bachmansville, Pa., has recently written me that the patient is working hard at his trade as a blacksmith, and can shoe as many as six horses in a day. When one remembers that in shoeing horses a blacksmith bends far over and almost constantly, one can see the great advantage that this man has in being free from the discharge and the prolapse of a sacral anus, and the necessity of wearing a napkin. Figure 3 shows the present condition of his perineum.

I would like also to call attention to the ease with which in case 2 the upper and lower colon were exam-

ined by Kelly's tube from the artificial anus as far as the sigmoid and the transverse colon. In doubtful cases, as this was, the method will prove of great use in determining whether any operation should be done.

A brief account of these cases is as follows:

Case 1.—Mr. H. H., age 55. Has had bloody passages from the rectum for three years, and has lost 29 pounds in weight, although still weighing 175 lbs. A thick, nodular mass entirely surrounds the rectum; no adhesions. Nov. 3, 1897, preliminary colostomy, Maydl's method. Bowel opened on second day, and entire protruding portion cut off flush with the abdominal wall at the end of a week. Disinfection of the lower bowel by boric acid through the natural and the artificial anus. Nov. 17, resection of rectum and coccyx, and sacrum removed to 3rd sacral foramen; 13 cm. (5 in.) of the bowel amputated, without opening the peritoneum, but exposing the prostate, vesiculæ seminales, and a large part of posterior wall of bladder (Fig. 4). Fifty ligatures. Invagination and closure by Lembert sutures of lower end of rectum. Closure of perineal wound. On the fifth day, probably as a result of slight leakage, temperature 103 degrees. Small amount of pus evacuated, when temperature immediately fell. Out of bed on 18th day, and went home a few days after. Dr.

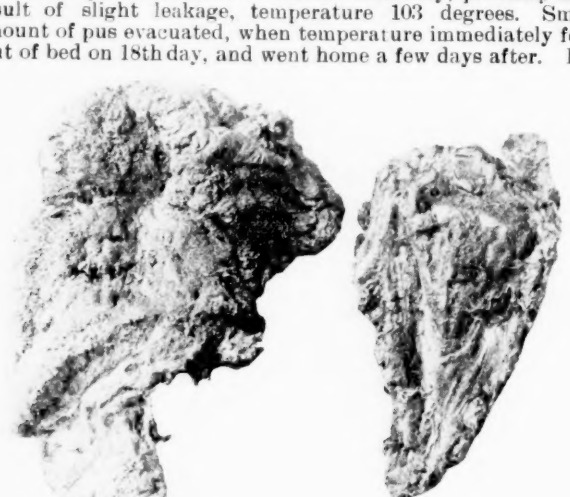

Figure 4.—Specimens removed in Case 1. Rectum, coccyx and part of sacrum.

Bashore writes: "The artificial anus answers admirably and has no disadvantages whatever. The mucus that collects in the rectum and lower colon is expelled upward. In the patient's own words: 'I feel as I formerly felt before stool; then, on bending forward, a sensation as if I had a stool, and the mucus is expelled on the bandage.' This happens about once in two days. He is in splendid physical health and has resumed active work as a blacksmith."

Case 2.—E. T., age 50. Pain in the rectum for a year and a half, with occasional blood. Was admitted to the Jefferson Hospital Dec. 20, 1897. A week before his admission I had examined the rectum in the out-patient department, by Kelly's proctoscopic tubes, and found a number of small polypi. Three of these were twisted off and examined by Prof. Coplin, who reported that they were tubulated adenomata, which in a patient of his age usually developed rapidly into cylindrical carcinomata. Dec. 22, 1897, I re-examined the rectum with the patient in the knee chest position and found a larger number of even larger growths than were discovered at the first examination. The larger ones were sessile. As it was evident that it would not be possible completely to extirpate these growths, and in view of their probable development into carcinomata, I advised amputation of the rectum.

Operation, March 19, 1898. Colostomy by Maydl's method. After packing the colon with iodoform gauze, I opened it immediately in the long axis and inserted Kelley's proctoscope, 22 mm. in diameter, 9 cm. downward and 8 cm. upward from the colostomy wound. I therefore was able to examine the rectum into the sigmoid flexure and into the transverse colon. Had I found that the adenomata extended upward into the colon to any great distance, I should have closed the bowel and abandoned further operation. As nothing abnormal was seen in either direction I decided later to amputate the rectum. The wound in the colon was therefore closed with glove sutures temporarily and was permanently opened at the end of a week.

Rectal operation, April 6, 1898. The ordinary Kraske operation was done, the sacrum being divided at the level of the third foramen. The prostate urethra and bulb of the corpus spongiosum and a portion of the wall of the bladder were exposed. Thirteen cm. of the rectum were removed (Fig. 5). A small rent was made in the peritoneum, but was immediately sewed up. Immediately above the growth the rectum narrowed very sharply to a calibre scarcely larger than the forefinger. Owing to the height and small size of the rectum there was great difficulty in invaginating the lower end. At the end of the sacrum it was not possible to draw the soft parts together, and in consequence a considerable dead space was left, which I packed with iodoform gauze. A certain amount of reactionary hemorrhage took place that night, which required several sutures to be cut and a repacking with gauze. The day after the operation his temperature was 101.8 but on

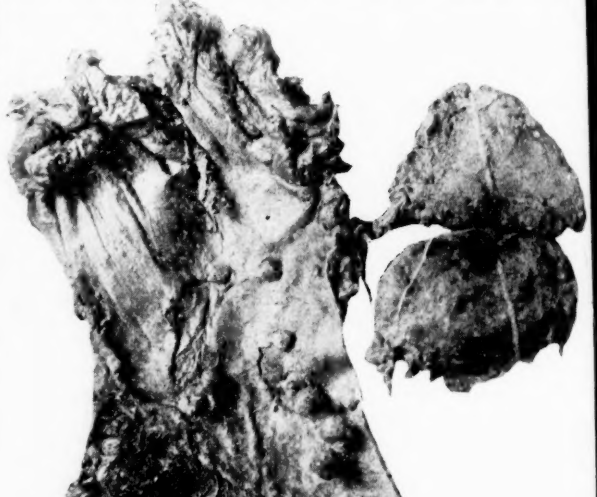

Figure 5.—Specimens removed in Case 2. Rectum and coccyx and part of sacrum, removed in two pieces.

the second day had fallen to 99 degrees. From then until the tenth day it fluctuated between normal and 100 degrees, but after that was entirely normal. The dead space left had slowly filled up, but was not quite cicatrized when he left the hospital, early in June. Since then it has entirely closed and he is in excellent health.

THE MEDICAL ASPECTS OF APPENDICITIS.

Presented to the Section on Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June, 7-10, 1898.

BY H. A. HARE, M.D.

PHILADELPHIA, PA.

In reading this paper on the medical aspects of appendicitis I am well aware that in view of the beliefs of some surgeons I am ordered to lead a hopeless cause. I hope to show, however, that this is not the case, although it is necessary for us to arrive at a definite idea as to what this title means. If it refers to the medical treatment in distinction to the surgical treatment and in the sense of the use of medicines in place of operative interference, then I am the wrong one to have asked to write on it, not that I believe that all cases are operative, but because I believe some are and some are not. If the diagnosis of the appendicitis is at issue other lines of experience must

be followed out, and if the pathologic aspect of the case is before us, still other thoughts must be expressed. Taking up for consideration the diagnosis of appendicitis, I may first point out that he who asserts that diagnosis is always easy has not seen many cases and probably mistakes other maladies for this one, and that it is the experience of active practitioners that cases continually occur in which the very gravest doubt as to the character of the case must arise. The extraordinary variation in the severity and locality of the pain as it occurs without palpation and with it, the difference in its character in various patients, and finally the extraordinary dislocations of the viscus anteriorly, posteriorly, above and below and behind the liver, make us think of the disease whenever a disturbance occurs in the abdomen, for cases have been recorded in which the appendix has been found almost anywhere and there is in the current number of the JOURNAL (June 4) an instance recorded in which the appendix was found under the left clavicle. Nor are we to expect to find the morbid lesions alike in any two cases. In some there is pus in excess, in others a small gangrenous tip with no pus or but little, in a third class a large indurated mass surrounding the appendix as a nut-shell surrounds its kernel, and it is an unfortunate fact that the more fulminating the inflammation, the more dangerous the condition and the fewer the physical signs. Indeed, aside from pain and general systemic symptoms, no signs are to be found. In the gangrenous type pain is often but a fleeting symptom and the speedy development of septic painless peritonitis misleads the physician, who can not elicit it even on pressure. Nor are we to regard appendicitis as being always an acute process. It is often subacute or chronic, insidious and provocative of aberrant symptoms which mask the real trouble. Lately I have seen a lad of nine years who was seized while at the sea-shore with indefinite pain in the belly occurring in paroxysms. He had fever, and the local physician gave him quinin and frankly said he knew not the cause of the fever. His fever disappeared and he returned home only to go to bed in a few days with fever persistently remaining about 104 degrees and no other symptoms. Finally repeated examination revealed right iliac pain, referred to the epigastrium on deep pressure, and the diagnosis of appendicitis of a subacute variety was made. Some days later he developed well-marked typhoid fever, the local appendicular signs disappearing under the local use of cold. I believe that this patient had a typhoidal infection of the appendix. Another case seen by me and afterward by Dr. Keen is instructive.

A man 43 years of age suffered from what was apparently a violent attack of appendicitis, in the summer of 1896. At that time he suffered from one attack of severe pain which he believed to be due to cholera morbus, and a few days later suffered from another attack of much less severe pain, with, however, a general sensation of illness which forced him to go to his bed. An examination by his physician revealed the fact that he had a marked swelling in the right iliac region, which was not only to be felt but which could be readily seen. From that time until the first of March, 1898, he was entirely free from any symptoms in connection with his appendix, the swelling disappearing within a week after it was first noticed, upon the application of counter-irritation, cold, and absolute rest in bed. In March of this year he presented himself to me complaining of aching pains through the bones and through his entire body and a general feeling of illness. The symptoms were more characteristic of influenza than of any other ailment, but no fever was present. Two days later I was sent for to see him at his house. I found him dressed and in an arm chair, feeling quite wretched, and with general diffused pains as before. His temperature at this time was 102½. I had already examined the right iliac region when he was at my office, because of his history of appendicitis, and I now made another thorough examination with negative result. His temperature continued to rise higher from day to day and he gradually developed, as his fever progressed more and more, pain in the right side of the abdomen until finally it hurt him to extend his leg or to raise his arm above his head. There were, however, at no time any signs of induration or very great tenderness on pressure in the neighborhood of his appendix. At this time he developed the rash of typhoid fever, his liver and spleen were found to be slightly enlarged, he had the curious odor of typhoid fever and presented a typical picture of enteric fever. At the end of his second week of typhoid, the pain in the right iliac region having increased, daily examination gradually revealed slight swelling in the right flank, which finally extended from the border of the last rib to the anterior superior spine of the ilium, but the tenderness was very moderate. He was seen in consultation with me on two occasions by a well-known physician, the second occasion being due to the fact that I had insisted upon the family allowing me to call in a surgeon and, owing to their fear of the knife, they asked for a medical opinion as to the wisdom of calling in a surgeon. This physician entirely agreed with me as to the necessity of interference. Dr. Keen, being called, also agreed and made an incision in the neighborhood of McBurney's point, from which escaped a pint and a half of exceedingly fetid pus having the characteristic odor of typhoid stools, but containing no fecal matter. A bacteriologic examination of this pus showed no typhoid bacilli, but the bacillus coli communis, and, floating free in the pus was a large mass which we thought, at first glance, to be a sloughed-off appendix, but which Dr. Keen asserted, upon dissection, was sloughed-off omentum. After the operation the patient, who of course was desperately ill, gradually progressed to a complete convalescence. We have then a case of typhoid fever, complicated by a recurring appendicitis perhaps due to impaired nutrition of the patient, in which the symptoms of typhoid and appendicitis were so complicated, and so masked one another that a diagnosis was most difficult, and had the peritoneal cavity not been walled off by a wall of lymph, there is no doubt that my patient would have died of septic peritonitis, complicating typhoid fever.

There are other cases in which the typhoid symptoms are due to septic absorption from the appendicitis and the diagnosis is that of typhoid fever first and appendicitis afterward.

As to the diagnostic symptoms of acute cases, rigidity is certainly of great importance. Its presence always makes one call the surgeon at once for his opinion, and I do not call a surgeon who believes that every case should be operated on, rather one who will be broad enough to know that judgment and expediency are to be applied to the decision of every case. I call a surgeon not as I would call a servant to do as I tell him, not as a master to direct what I shall do,

but as a colleague who will present the surgical aspects to me as I will the medical ones to him. He is to take part in my joys and sorrows and not to be weak and indecisive nor dictatorial and ambitious.

I have recently published in the *Medical News* some interesting cases of appendicitis which show how one may be harassed by conflicting experiences. In one case I implored, besought, pleaded and insisted that a young fellow with a history of nine attacks in six months should have an operation. He had an immense mass of inflammatory material about his appendix. He finally consented. One of the most eminent surgeons living operated. Stercoraceous vomiting speedily ensued with collapse and death. I forced this man to an early death. In another instance I advised delay, because after this experience I had lost my nerve, for it came to my hands a few days after. Death met me again. Another case had a sharp attack of pain with every classical sign of the disease. A surgeon said operate. The weather was excessively hot, the patient a feeble woman of 50 and I felt sure the operation would kill her. I called a medical consultant who agreed with me. No operation was done and the patient is now well and has had no attack since. I could go on with such cases indefinitely and reach no clearer ideas as to the subject.

As a matter of fact we can divide all cases into three sets: those which undoubtedly should be operated on at once, those about which doubt exists and those that get well of moderate attacks and have no more. One man injures his knee-joint, it must be opened; another injures it and the question arises, shall we save it; a third gets well without the knife with good sensible external treatment. There are no cases to be met with in practice which need identical routine treatment, for individuals differ, infections differ and circumstances differ When the profession recognizes that appendicitis is a disease in which medical and surgical opinions are always to be married and when dogmatic operators cease to combat dogmatic physicians then will these cases present the best statistics of recovery.

Finally a word as to opium. It will not cure the disease, nor will it limit it. If it is used to excess it is harmful in more ways than one; but used with judgment it is of value to take the edge off the excessive pain and to support the system. If it is used in such amounts as to remove the pain and produce sleep, it is abused. The question is not opium or no opium, it is whether it is needed as a palliative of pain until the diagnosis is clear or the surgeon is ready.

THE EARLY TREATMENT AND INDICATIONS FOR OPERATION IN APPENDICITIS.

Presented to the Section on Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY WILLIAM M. HARSHA, M.D.,

PROFESSOR OF OPERATIVE AND CLINICAL SURGERY, MEDICAL SCHOOL OF UNIVERSITY OF ILLINOIS,

CHICAGO.

Although appendicitis is more than ever regarded as a surgical disease, a majority of cases are first treated by medical men. To one trying to follow the drift of opinion on its various phases as expressed by those best informed, it is clear that there is yet a great lack of agreement on many important points. In view of the importance of the history of any given attack a precise diagnosis is indispensable at the earliest possible time. Physicians should therefore carefully examine every case, beginning with or attended by abdominal pain. The diagnosis established, the next step will be either medical treatment or surgical operation. The number of those who favor immediate operation, except in fulminant cases, is small, as compared with the advocates of an observation period of from twenty-four to thirty-six hours. It is the general belief, in which the writer shares, that a considerable number of cases seen in the beginning of the first attack are either aborted by medical treatment or subside spontaneously by the end of twenty-four hours, and of these a majority have no recurrence. The advocates of immediate operation have to figure on a degree of danger, from operation or sequelæ, which equals, if it does not exceed, the slightly increased danger of the smaller number that will require operation at the end of twenty-four or thirty hours. The advantage and the weight of opinion, if we may judge from the reports during the past year, are on the side of waiting this short period, except in fulminant cases. In this class there is a general agreement in favor of immediate operation.

In moderate cases the early medical treatment will be considered. Absolute rest in bed, abstinence from food, hot or cold applications locally are agreed upon as of the first importance. Hospital care, or that of a trained nurse, is almost as uniformly considered essential. In directing the local applications, antiseptics should be used with a view to possible operation. The pulse, temperature, degree of pain, general distress and appearance should be carefully noted. Failure to relieve pain or to render it endurable by these means will suggest anodynes in some form. With reference to the use of opium there is the greatest difference of opinion expressed by the best of physicians and surgeons. Prof. William E. Quine, from whom I heard a clinical lecture on appendicitis fifteen years ago, recently expressed in his most impressive and explicit terms the same endorsement of the use of this drug when indicated, which characterized the lecture to which I have referred. Herzog[1] says that those practitioners who use it have the satisfaction that their cases recover as often, if not oftener than those in which it is not used, and, if so, they probably remain more comfortable during the painful stages of the disease. Many surgeons deplore its use because, as it is said, "it puts out some of the danger signals." Judging from a majority of opinions and from my own experience in a considerable number of cases, it is my firm belief that there are distinct advantages in its use in certain cases and stages, if used with proper precautions. The influence on pulse and temperature of opiates in quantity just sufficient to promote the comfort of the patient should not confuse the observing physician, especially if the patient is under the observation of a competent nurse. The amount required will further indicate the severity of symptoms. Codeine hypodermically is probably the best form in which to administer anodyne, causing less gastric disturbance and interfering less with catharsis, should that be indicated at the same time. Should vomiting be present and further stomach evacuation desired, warm water to facilitate emesis, either as a drink or by stomach tube, is indicated before the opiate is

[1] Deutsche Zeit. Chirurgie, 1897, p. 214-230.

given. The coal-tar products, owing to their greater interference with pulse and temperature and their less efficiency as pain-killers, should not be used. It is scarcely believed by anyone now that opium shall be the mainstay or sheet-anchor in the management of appendicitis, as was formerly taught, but a majority justify or recommend its use in a cautious manner. It relieves the shock of pain, is humane and palliative, and sometimes curative by relieving inflammatory spasm, quieting and favoring limitation of the inflamed area and resting the nervous system.

The use of cathartics is the next mooted question in the medical treatment. McBurney[2] says: "Cathartics are not indicated at the beginning of an attack, as they tend to increase gastric, intestinal and general unrest." A majority of recently expressed opinions, however, favor prompt and free catharsis at the earliest possible time, provided the attack has not been attended by a profuse diarrhea. A majority of cases probably are preceded by constipation; many cases follow the ingestion of a generous meal; and many cases, approximately 25 per cent., are either cut short or spontaneously subside after thorough evacuation of the bowels. Stenosis of some part of the appendix plays an important part in the evolution of an attack, and free serous depletion is indicated to eliminate the congestive element of the stenosis; with the safety-valve free and fecal circulation re-established, the danger of explosion or perforation must be lessened, although infective inflammation may go on to the destruction of the appendix.

During the first twenty-four hours in moderate cases in the first attack there is no material impairment of the appendix wall; there is, therefore, slight danger of perforation; while the hope of aborting the attack or securing a better condition for operation lies in early and free intestinal clearance. With this, as in other phases, the indications must be observed at the bedside and every case considered by itself. Opiates or cathartics should not be advised nor interdicted because the patient has *appendicitis*, but because of special indications.

As to the best means to catharsis, we may consult the taste or idiosyncrasy of the patient. Enemata will relieve the colon, small doses of mild chloride of mercury alternated with some acceptable saline will answer best for the intestinal tract generally. Epsom salts causes serous depletion with little peristalsis. In some cases where there is persistent vomiting, and medicines cannot be given by the stomach, I would suggest the use of hypodermic medication with the same purpose in view, viz., catharsis. This suggestion of hypodermic purgative administration is not new, but so far as I know it has not been applied to appendicitis, although recommended in general abdominal surgery as indicated. In 1893 a paper was read by Rohe and Wade before the Pan-American Congress, detailing the results in one hundred injections of 2 per cent. solution of sulphate of magnesia in doses of 1.86 gr. to 4.5 gr. Injection was made in the arm. The results were positive in 67 per cent. of cases, average time for effects seven hours, forty-five of sixty-seven times produced watery evacuations. Inquiry as to other drugs by which the purgative action might be hastened developed the knowledge of the veterinary practice of hypodermic use of eserine, or what is known officinally as sulphate of physostigmine. This drug increases intestinal peristalsis very promptly and markedly, and intestinal secretion somewhat less. The writer has tried hypodermic tablets, prepared by Sharp & Dohme (one-fiftieth gr.), and suggests as worthy of further trial a combination of sulphate of magnesia, as recommended by Rohe and Wade, with sulphate of physostigmine hypodermically as a means of prompt catharsis in stages where increased peristalsis may not be considered dangerous. Other indications for use of the combination are obvious and where oral administration is impossible or difficult.

In cases preceded by violent catarrhal diarrhea, no doubt the congestive stenosis is a most important factor, whatever may have excited the local inflammation. Treatment directed to this condition is then indicated; rest, abstinence from food, warm fomentations as detailed. If evacuation has not been complete, a saline or castor oil will aid in its accomplishment, or the hypodermic method mentioned, after which a hypodermic of codeine will aid in quieting the intestinal tract. If evacuation has been complete, rest alone or with codeine may answer. With the subsidence of the catarrh of intestines the local appendicular trouble may disappear. As much in the way of treatment has probably been named as will occupy the first day; in this early period great pains should be taken to locate accurately the seat of trouble, as the future may develop urgent need of accurate location and tympany may obscure it. Should there be recession of symptoms at the end of twenty-four hours with return of patient to comfort and normal condition, he will probably go on to recovery without abscess or other serious trouble. The means named, together with any safe minor symptomatic treatment that may be clearly indicated, extending over the first twenty-four hours, will aid in cutting short many attacks if the writer can judge from his own experience. Should these fail or the attack not subside in the time named, or show marked tendency thereto, an operation should be done in every case, as a complete and safe procedure can at this time be confidently undertaken. Failure to act at this time subjects the patient to dangers that no one can estimate. This does not mean that operation is to be undertaken at any time after twenty-four hours. Richardson's opinion that there is a time too late for safe early operation and too early for safe late operation, I believe to be sound, although that time cannot always be determined. Most fatal operated cases are either due to delay until this intermediate period or until general peritonitis has set in.

In fulminant cases, the earlier the operation is done the better, and no medical treatment except rest, fomentations and opiates to make life endurable until operation can be done are here advised. If the surgeon takes this view of the subject and is called within the first twenty-four hours, in all cases the mortality will be reduced to a minimum, and the operative treatment will become established beyond a question in fulminant or progressive cases.

The trouble with the prevailing practice is that the surgeon is not called in time. In the later stages of the disease is where the indications for operation are not so clear, and unfortunately this later time is when the surgeon is often called. The uncertainty as to intra-abdominal conditions in appendicitis is one of the best established facts in surgery. Dr. Murphy wisely enjoins those who may expect his services to call him early.

[2] Dennis, System of Surgery, Vol. iv, p. 415.

Those who favor awaiting abscess formation should bear in mind that such occurrence is uncertain, and that general peritonitis may set in; that should abscess form, it may be deep-seated and central, and present insurmountable obstacles to drainage; further, that in event of abscess favorably located, the appendix may not always be removed with safety, and finally that hernia is likely to result after drainage cases.

In the intermediate inflammatory stage, characterized by serious systemic disturbance, where the process is still limited but not circumscribed by safe adhesions, it is probably better to use opiates to quiet peristalsis and await the walling off process. Here the patient is in imminent peril with or without operation, but the testimony of a limited experience and considerable observation convinces the writer that the least danger attends delay. It is the large mortality attending operations in this stage (and in general peritonitis) that discredits surgical intervention. It is in this stage that decision as to operation is most difficult. The great systemic disturbance many times determines the operation when it should favor delay. No other phase of the disease except approaching or present collapse of the diffuse suppurative period is so dreaded by the surgeon, and it would be a wonderful relief to him, as well as a great boon to the patient, if he could forestall that condition by early operation. If an abscess has formed when the surgeon is called, and the more acute symptoms have subsided, operation is indicated except when such abscess is centrally and deeply placed. In such cases, owing to the great difficulty of draining, it may be better to take the chance of spontaneous evacuation through safe channels. By operation in the abscess period the weight of opinion is overwhelming in favor of leaving the appendix rather than to break up protective adhesions. Should the appendix be present or be found within the cavity, it should, of course, be removed. Should the patient suffer a recurrence from the non-removal, which occasionally happens, the rule of early operation applicable to that condition will yet work out his salvation. Who of us would not rather submit to the knife twice and recover, than have one *complete* operation and die?

In recurrent cases or those in which chronic inflammatory process is present, operation should be done. In the second attack too early operation can not be done. If the patient is seen after the second attack, interval operation is agreed upon as best, the safest time being two weeks or more after the attack. In chronic cases we are in constant danger of immediate or precipitate perforation, which adds greatly to the danger of operation, and still more danger to delay; it is therefore safer to remove the appendix and forestall imminent danger.

In considering the principles that should govern the operative treatment of appendicitis, we should not be influenced by the fact that their practice in the hands of inexperienced operators may result in a greater death rate than if left to nature. Van Hook[3] expresses the belief that cases of acute perforative appendicitis will show a higher percentage of recoveries under medical treatment with incision of presenting abscess than when operated by surgeons who are gaining their first experience. The inference that novices should not attempt appendicitis operations is obvious, but that should not weaken the position of those who believe in early operation by competent surgeons. Morris[4] well says, "The teaching of a correct surgical principle should not be abrogated on the ground that many improperly prepared men will try to carry it into effect."

Grieg Smith says in reference to the mooted questions arising in consideration of this subject, "It is impossible to be definite and wrong to be dogmatic." The surgeon can only decide in any given case at the bedside. There is a considerable number of writers on the subject who advise operation as the safer plan in case of doubt. Although American surgeons are charged with too great readiness to operate, I believe the encouragement in this direction has come from those with the largest experience and are therefore best able to estimate the advantages of early operation. I believe the mortality can be reduced to less than 5 per cent. if competent surgeons apply these principles.

Columbus Memorial Building.

[3] Jour. Am. Med. Association, Feb. 20, 1897.

[4] Jour. Amer. Med. Association, May 8, 1898.

PENETRATING WOUNDS OF THE POPLITEAL ARTERY.

Presented to the Section on Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

BY GEORGE W. MIEL,
DENVER.

Though of small experience in dealing with penetrating wounds of the popliteal artery, the especial gravity of this accident itself, or because complicated with other injury, and vice versa, has impressed me with the desire to look well into the subject, and giving my deduction, ask the criticism of this society.

By carefully investigating a deep external wound in the vicinity of the popliteal artery, extended if need be by dissection, we exchange uncertainty for certainty. Should such a wound communicate with the artery, we should remember a small puncture, even if occluded, may ulcerate and occasion secondary hemorrhage, which should at least put us on our guard. An incised wound of more than an eighth of an inch requires ligation with complete division of the vessel between. A penetrating laceration of even less extent calls for the same procedure. A considerable laceration, and an uncomplicated gunshot division of the popliteal artery, requires double ligation away from the wound in a sound portion of the artery, with extirpation of the intervening wounded portion, and ligation of considerable branches given off. A true puncture wound from without and communicating with the popliteal artery seldom occurs. The artery is occasionally divided from within by pointed or edged exostosis. *Procedure.*—Intermitting digital or shot-bag compression at the pubis, unless distension by thrombus or diffuse traumatic aneurism is so great as to threaten the collateral circulation, when, with provision against hemorrhage, dissection must be made to turn out clot and tie ends of artery.

In dealing with complicated wounds of the popliteal artery we take up one of the most difficult problems the surgeon is required to solve: When to amputate, when not to amputate, with his patient's life, deformity and impaired usefulness, weighing in the balance against extra hazard—but life, limb and perhaps unimpaired usefulness. While justified in

king chances to save limbs, we must well consider the ossibility of greater loss through complication, and f life itself. Our first consideration should be for fe.

A wounded vessel of great importance, a fractured one, even badly comminuted as from gunshot injury, perforated joint, a considerable separation or loss of tegument, in themselves do not necessitate amputaion. In combination, however, they may call for it s the wisest procedure, or may necessitate it for the reservation of life, or as offering the better chance or life. Gangrene supervening upon injury dividing he popliteal artery is in the large proportion of nstances fatal. The popliteal artery must perform s function or the collateral circulation must take up s work partially or wholly, besides its own, or the arts below perish.

As complicated division of the popliteal artery, ecause of its protected position, is usually the result f extreme violence, which these structures quickly esent, the resulting inflammation has a most serious ffect upon the collateral arterial supply to the leg. The tissues already held nicely taut by the tough, esisting and closely attached enveloping deep fascia, eave only the popliteal space relaxed. Tightened hen by effusion without, and within the joint, inflammatory deposits, and perhaps thrombus, the collateral essels, instead of accommodating themselves to the ncreased amount of work, are actually, I should hink, in most instances unable to perform their ccustomed work. In our effort then to save a leg, it eems plain that our own wound in dealing with upture of this artery, or the communicating wound f violence, should be never more than loosely closed; ut preferably dealt with by nice grouping of the eep structures and neat tamponade; in some cases using, if thought best, provisional, or loose deep suture elow the fascia latta and integumentary structures verlying. The life of the leg depends upon relaxation f the enveloping covering, and avoidance as far as ossible of harmful constricting pressure.

Too often, unfortunately, when the popliteal artery r vein is ruptured, in our unsuccessful effort to save a leg, a life is lost. Gangrene supervening is moist, nd of the quickly spreading or fulminating type; and n vitiated subjects it may spread from the wound. Demarkation is absent; and decomposing fluids pass eadily into the general circulation. Amputation then, a last resort, occurs at the worst possible time and must be done far above. It is then at the time primary amputation can be practiced, that modern reliable, and properly classified statistics would be of invaluable service in this desperate emergency.

In our present text books, so far as I have seen in a considerable search, statistics upon injuries invading the knee are grouped in a general way with injuries involving the great articulations, which is unfortunate and misleading. The serious injuries involving the knee, and which raise the question of amputation, necessitate separate, definite, and full statistics. The nearest approach to such compilation is available to us in the separate instances, and small collection of cases, of division or rupture of the popliteal artery, reported from year to year in the Annual of the Universal Medical Sciences; in aggregate few, and by far the larger proportion are instances of ligation and various procedure for completely ruptured popliteal aneurysm.

Our available statistics attending double ligation of the popliteal artery in uncomplicated cases would indicate at present a mortality of some ten per cent. While each case of complicated perforation of the popliteal artery must be judged separately, something approaching definite action may be applied in accordance with carefully compiled statistics based upon the antiseptic system. Primary major amputation, while always a grave emergency operation, other conditions being equal, differs in degree. Amputation, of necessity, is accompanied with more shock than that which attends what might be termed amputation of seeming necessity, or expediency. Considerable loss of blood naturally adds seriously to the issue of ligation or amputation, notwithstanding auto, mediate arterial, or saline transfusion.

If then we can have available statistics of complicated penetrating injury—division or rupture—of the popliteal artery in their several combinations, with result of effort at saving the leg—"waiting"—in contrast to statistics of amputation, we can proceed more definitely in our patient's better interest. And if it shall be shown that primary amputation offers unquestionably the better chance for life, the patient concurring, and other circumstances being equal, that should be our procedure. In the words of Connor, "Final judgment as to the necessity of amputation in any given case must be sustained by the latest surgical experience."

Today the telephone and better hospital facilities and appointments permit us to take greater chance than formerly. Taking the chance, the patient must be under frequent scrutiny that at the first sign of approaching gangrene—cold leg and marked stasis, or erysipelas—we can, and should, resort to proper amputation above the knee.

DISCUSSION.

Dr. B. MERRILL RICKETTS of Cincinnati—This subject should receive more attention in the future. I desire to refer to Dr. Crile's paper in connection with this subject, as he has demonstrated that the common carotid artery may be obstructed by pressure from twelve to twenty-four hours without injurious effects, and has shown that there is no danger in such obstructions. The carotid has been clamped in a human being during an operation for a removal of a tumor of the neck. Within the last ten days I have torn off the external iliac vein in removing a tumor from the iliac fossa, and no serious consequences have resulted after ligation. I believe it impossible to suture or make anastomoses by any of the methods so far devised, but in future it looks as if we should be able to do something for penetrating the wounds of these vessels. My brother had a case fourteen years ago where the deep profunda was shot off close to the femur, and extensive hemorrhage followed. The leg was cold, and an amputation was performed at the hip joint, but the patient died forty-eight hours later. Today we would doubtless adopt other measures and be more energetic in trying to save the limb. It might be better to divide the artery rather than sew it up.

Dr. OLIVER of Cincinnati—I recently had a case bearing upon this subject in a boy 12 years of age, whose foot had been caught in the wheel of a carriage, producing a compound fracture of the femur at the epiphyseal line. The lower end of the upper fragment projected through the popliteal space, and there was a large ragged wound corresponding to the point of exit of the femur. When I saw the case three hours later, pulsation of the popliteal artery could be plainly felt in the wound. The fracture was reduced by extension and pressure, and the foot appeared normal the next morning, but on the second morning symptoms of obstructed circulation were present, and on the ninth day amputation had to be performed. In a dissection of the leg, after amputation, considerable effusion was present in the deep fascia, which was probably the cause of the obstruction to the collateral circulation and the resulting gangrene. Two inches of the popliteal artery were found to have been destroyed, and I was very much impressed with the fact that the unyielding dense fascia had been responsible for the gangrene of the limb. In future cases I shall open the deep fascia thoroughly, as I do not see any reason

why we should not save these legs and convert the operation into a simple ligation of the popliteal artery.

Dr. TINKER of Philadelphia—Experimentally the descending aorta has been divided in an ass and the animal recovered perfectly. When it was killed several months later, firm union was found to have taken place between the divided ends.

Dr. B. MERRILL RICKETTS—As to the size of the artery, anastomosis seems to be more successful in the larger arteries, and the experimental work referred to by Dr. Tinker would seem to prove this, the artery in the ass being very large.

Dr. MIEL, in closing—As to the temporary closure of the vessels, this is especially desirable in dealing with wounds about the mouth, and if this can be successfully accomplished we shall have a much better method than in permanently ligating the common carotid for conditions about the throat and tonsils.

Dr. Oliver's case is one of the kind which prompted me to read this paper. I had a case of a man in whom amputation of the foot had been performed, and although I believed good circulation was present, gangrene supervened and the leg had to be amputated, the man subsequently dying from septic infection.

I remember another case of compound fracture of the knee where amputation had been deferred. I knew nothing of the involvement of the popliteal artery in the case, but subsequently ascertained that a spurting of blood had been noticed at the time of the injury. The brother of this patient objected to operation, and unfortunately very often in these cases these objections cannot be removed until it is too late to operate. I believe that compression of the vessels had much to do with causing the gangrene.

As to end-to-end anastomoses, if they can be successfully accomplished, we are rid of a very formidable operation which has carried away many individuals.

ANEURYSM OF THE AORTIC ARCH.

LIGATION OF RIGHT SUBCLAVIAN AND COMMON CAROTID ARTERIES.

Presented to the Section on Surgery and Anatomy, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY B. MERRILL RICKETTS, PH.B., M.D.

CINCINNATI, OHIO.

While any point throughout the arterial system may become aneurysmal, it is aneurysm of the aortic arch to which special attention will be given in this paper. The pathology, which is fairly well understood, will not occupy much space, but give place for more thought upon the treatment, which has, from the time of the great masters—Antyllus (fourth century), Anel (1710) and John Hunter, baffled the skill of all. Its successful treatment at the present time is practically *nil* in ways other than surgical. Even this method has been of but little consequence until within the last few years, when by accident Christopher Heath (1865) discovered the beneficial results to be obtained from ligation of the right subclavian and common carotid arteries, supposedly for aneurysm of the innominate. Death four years later revealed aneurysm of the arch and much new tissue within the sac. Nine additional operations have been made since then by as many different operators, with most brilliant results in the seven which survived the operation, and had not the mortality before the days of asepsis been so great, many more cases would no doubt have been subjected to such surgical measures. Even at this late date, the ligation of these arteries, for this condition, does not receive its merited attention.

Thus it is, perhaps, that the obstruction of these vessels for many conditions have been made fewer, but now that more perfect methods have been inaugurated—methods which enable the work to be done with slight, if any, mortality—much more will be accomplished in this direction. There is no form of aneurysm, except those intracranial, which has heretofore offered so little encouragement in the way of treatment.

The methods of Tueffnell and Schott have been followed by favorable results in a few cases. In point of fact, recumbency and diet are to be advised in all cases of aneurysm, as are occasionally baths and graduated exercises. These, in conjunction with mercury and the iodids, should, as a rule, be resorted to in all forms of aneurysm, especially of the arch and innominati, before surgical intervention. They should also be applied after the ligation of aneurysmal vessels; especially are they beneficial in those of syphilitic origin.

The interesting demonstrations of Drasto (1895) upon the dog, by injecting a solution of gelatin into the veins, have warranted its introduction into the first portion of the arch in man, where aneurysm of the arch existed, with, however, negative results. Macewen's method of introducing, first needles, and then wire, into the sac, both with and without galvanism, has proven itself of great value, the most marked beneficial results having been obtained by Hare some fourteen weeks ago. He introduced ten feet of gold wire into an aortic aneurysm through a hollow needle, to which galvanism was applied, gradually increasing from three to seventy milliamperes. Indeed, this seems to be a most rational method of dealing with a limited number of these cases, and while the object of any method is to produce coagulum, it would seem that fragments of it produced in this way (especially if the opening into the main vessel should be large) would be more likely to become detached and enter the general circulatory system.

At present, there is absolutely no means of determining the character of the opening into the sac. The method would seem to be applicable in those cases with one or more small openings. Even then the wire might pass from the sac into the artery; thus it is that this method is attended with great risk and mortality. It would seem to be the extremely large opening that would preclude the possibility of beneficial results from any method.

While the autopsy in Dr. Hill's case three months after ligation (Cincinnati *Lancet and Clinic*, March 19, 1898) showed it to be one of the most unfavorable for either ligation or the introduction of wire, large quantities of fibrous tissue had been deposited within the sac since operation. He was greatly benefited, so much so that he was enabled to return to his duties—those of a policeman—after a few weeks. He died suddenly from rupture of the right auricle, while sitting at the table eating breakfast. About twelve pounds had been added to his weight, and he was comparatively comfortable.

It may be argued that the ligation of the subclavian and common carotid arteries in this case superinduced the heart rupture. Had the left auricle subsequently ruptured, one might indulge in such belief. Of the 412 recorded ruptures of the heart (Hill) from all causes, but one of the right auricle occurred. It must therefore be presumed to be an exceedingly rare condition, and one not due to obstructing these important vessels. Diagnosis of aneurysm of the arch is not certain, as it may exist without detection of murmur or other symptoms. If discovered, its character must be absolutely unknown, except by autopsy. This, therefore, must necessarily make more uncertain

the proper course to adopt, and much speculation must ensue. The following classification might not be amiss: 1, those in which the right subclavian and common carotid arteries should be ligated; 2, those into which wire should be introduced; 3, those in which nothing should be done.

It may be that those in the first and second would be equally benefited by either procedure. That each has been beneficial to a very high degree there can be no question; in fact, greater benefit has been obtained by these two methods than any other.

The modus operandi of the second is more easily understood than that of the first, even though the first has been followed by more permanent and universal results. But the great underlying principle upon which rests the method of ligating the subclavian and common carotid arteries does not seem to have been discovered until the time of Wardrop. He it was who demonstrated that less resistance was necessary to produce consolidation of the contents of the sac than was formerly thought to be. It is, therefore, to be supposed that the obstruction of the innominate, or its branches, would be sufficient to more or less retard the rate of blood-flow through the sac. This retardation would necessarily seem to correspond with the opening into the sac, hence the amount of lymph deposit would be influenced. Now, it is not necessary to close a vessel that complete consolidation of an aneurysmal tumor may ensue. So it is that lymph may be deposited within the sac, first in the depression of its wall, and especially at the opening of the innominate.

The case herein reported was first referred by Dr. H. A. Beeson of Leesburg, Ohio, in the spring of 1897. Male; white; age, 40; family history negative. He complained of pain in right infra-clavicular region, extending beyond sternum, and in right arm, especially exaggerated on movement of arm, incapacitating him for his work—that of a blacksmith and wagonmaker. On examination, a swelling was found extending from middle third of right clavicle, slightly beyond median line, and extending over two or three intercostal spaces. No bruit could be found at this time. On questioning him, found that twenty-two years previous he had a suspicious sore upon the genitals. The diagnosis of aortic aneurysm due to syphilis was made, and the patient put on anti-syphilitic treatment. The few reports from him after were that he was improving, being at the end of three months able to resume his work. On the 15th of February last, Dr. Beeson again brought the patient to me. The pain complained of at his previous visit was even now not so severe; but he was becoming more and more short of breath, and was gradually losing flesh. Examination again showed swelling, slightly greater than before, and now a very decided bruit was found in medial line near junction of second and third portions of sternum. The bruit was especially distinct on the introduction of stethoscope into patient's mouth. The pulse was about eighty—full and strong. It is to be regretted that the sphygmograph was not used. An operation was advised and made. The patient was chloroformed, and under as nearly aseptic conditions as possible, the subclavian and common carotid arteries of the right side were ligated with kangaroo tendons; the former requiring seven, and the latter five minutes. The wounds were dressed with collodion. The patient made an uneventful recovery, and returned home at the end of twenty-one days. After the third day, the bruit was less marked, growing gradually less as time progressed, until now no bruit is to be heard, but there appears to be great commotion within the dust walls on auscultation. The operation caused no appreciable change in the circulation, and the temperature was only slightly elevated for a few days, on the second day reaching 100. The chest prominence at time of patient's dismissal from hospital was much less than before operation, and pulsation that was distinct three weeks before almost gone, showing the rapid progress of probable consolidation. He has gained about twelve pounds, and now reports that he feels better than at any time for eighteen months.

The following conclusions are submitted:

1. The remedy lies within the domain of surgery.
2. There are but two such methods at the present time to be considered: (*a*) Obstruction of the right subclavian and common carotid arteries; (*b*) Introduction of wire or needles into the sac, with or without galvanism.
3. Either one or both of the operations should be applied in all cases after a thorough saturation with the iodids.
4. Ligation is attended by less danger, less mortality, greater and more permanent and universal benefit.
5. Ligation of the subclavian and common carotid arteries is less dangerous than ligation of the innominate. In point of fact, the latter should not be done.
6. The iodids should always precede and follow any surgical interference.
7. Extreme atheroma might contraindicate ligation.
8. Extreme atheroma might possibly indicate the introduction of needles, or wire, with or without galvanism.
9. Atheroma to some degree is present in the majority of arch aneurysms.
10. It is impossible to technically classify arch aneurysms.
11. The results of ligation in the case herein contained have been far more beneficial than was ever anticipated.

REMOVAL OF THE EPITHELIOMATOUS TONSIL, BY THE EXTERNAL ROUTE (PHARYNGOTOMY), WITH A REPORT OF TWO SUCCESSFUL CASES.

Presented to the Section on Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY A. F. JONAS, M.D.,
OMAHA.

It is not our purpose today to discuss epithelioma from an etiologic or pathologic standpoint: these subjects belong to those who are more competent, and should receive consideration only from those whose authority is based on experimental research. As practical surgeons we are chiefly concerned in the clinical and operative aspects of this insidious, relentless and fatal disease.

We will direct our attention to the tonsil when affected by epithelioma. This, on first thought, does not seem to be the place for discussing diseases of the tonsil, but nearly every special field that is more or less surgical, will have in it more or less work for the

general surgeon. The field of laryngology and rhinology, in common with others, contains many diseases whose surgical magnitude and responsibility seem to require a general surgeon for their management. The cases which will serve to illustrate our theme today were referred by the specialist to the surgeon, therefore the cases were transferred from the department of laryngology to that of general surgery, and hence their presentation at this time and place.

The results from operative and other treatment of malignant disease of the tonsil have been so unsatisfactory, perhaps more unsatisfactory than when located in any other accessible cavity, that Butlin, after very careful research, exclaims: "The prospect of permanent relief by operation in any case of malignant disease of the tonsil is very small, even if there can be said to be any. Removal of the disease through an external incision (pharyngotomy) has hitherto proved a dangerous proceeding, and has not yielded as good results as operations through the open mouth." In future cases, pharyngotomy cannot be recommended and, unless the results produced by it are far better for the next series of cases than those which it has yielded hitherto, it must be condemned as an unjustifiable proceeding." This is certainly emphatic language by an eminent authority. And yet we cannot stand idly by without an attempt to remedy the existing condition.

With improved technique, increased experience and a more thorough knowledge of the dissemination of epithelioma and the more encouraging results from extirpation of epithelioma in other glandular organs, more especially epithelioma of the breast, as operated according to the painstaking and minute attention to detail as taught us by Halstead, we have been prompted to renewed efforts when the disease has attacked the tonsil. Fortunately, primary epithelioma of the tonsil is a rare disease, so infrequent indeed that those of large experience have seen very few cases.

I desire to place on record two cases of epithelioma removed by the external route, by the operation known as pharyngotomy.

Case 1.—M. H., mechanic, aged 40, American, married, has always enjoyed good health, except for recurrent attacks of tonsillitis extending over a period of five or six years, the attacks recurring at least once a year, and often ending in suppuration. During the intervals his throat was sensitive, much accumulation of mucus and frequent hacking cough. His family history was negative, none of his immediate relatives having been affected with carcinoma or tuberculosis.

During the last year, and since his last attack of tonsillitis, he has had increased tenderness and sensitiveness in the right tonsillar region, with occasional expectoration of blood, which he believed to have come from the right tonsil. Deglutition became difficult and painful. He had lost in weight, which he believed to be due to his inability to swallow proper food, his diet during the last three months having consisted largely of fluids. On inspection, the right tonsil was found to be enlarged, ulcerated on its median side. It was found to be very sensitive to the touch, bleeding easily. On palpation with the finger it was found to be hard and irregular over its entire surface. It was slightly movable. The pillars of the fauces were not involved, and the entire process, from the mouth seemed to be confined to the tonsil itself. The pharynx and naso-pharynx were reddened and slightly edematous. The opposite tonsil was moderately enlarged, but to the touch with the finger, as well as in appearance, presented nothing that would suggest malignancy. Beneath and slightly posterior to the angle of the right lower jaw was found an enlargement, the size of a hickory nut, which was painful and tender on pressure. The diagnosis of epithelioma of the tonsil was made. It now became a question whether this mass should be removed through the mouth by excision, galvano-caustic snare, or by the external route through the submaxillary triangle. On further examination it was found that the entire growth could not with certainty be removed through the mouth. A pharyngotomy was then decided upon.

Under chloroform anesthesia, a triangular flap was reflected forward, the lines of incision extending along the lower margin of the lower jaw, beginning about midway on the horizontal ramus and extending to the mastoid process, and thence downward along the anterior margin of the sterno cleido mastoid muscle, to a point opposite the cricoid cartilage; the submaxillary and superior carotid triangles were exposed. The enlarged and affected gland was situated within the submaxillary triangle; by means of blunt dissection the surrounding structures were separated without much hemorrhage. The sterno cleido mastoid, together with the carotid artery, the internal jugular vein and pneumogastric nerve were retracted posteriorly with blunt hooks. The diagastric, mylo hyoid, hyo-glossus were likewise retracted. The tongue now became unmanageable, interfering with respiration, so it was drawn forward and held by means of a vulsellum forceps. The left index finger was now introduced into the mouth and pressure made outward against the tonsil. The head was drawn strongly to the left side, and by means of a blunt dissector the tonsil was gradually separated, and the growth removed. The pharynx and larynx could now be inspected. With curved scissors and pincette the ragged margins of the wound were trimmed. No blood seemed to have entered the larynx. The pillars of the fauces were drawn together with catgut and the external wound closed with deep interrupted silk sutures. No drain. The healing process was uneventful. The patient was nourished with a feeding tube nearly two weeks, after which time deglutition gradually improved. The patient was last seen nearly four years after the operation, with no trace of recurrence.

Case 2.—H. M., farmer, aged 56, married, muscular, well nourished. He was always well until eighteen years ago, when he suffered from pneumonia, from which he completely recovered. He has been of constipated habit for nearly twenty-five years; has had hemorrhoids in mild form. His digestion has been imperfect, eructations of gas and occasionally of fluids, which he described as being at times sour, at other times bitter and again salty in taste. For many years he has had chronic pharyngitis, always greatly aggravated on exposure to cold, producing hoarseness and much tenderness during deglutition. About one year ago he began to experience pain, sometimes of a lancinating character, and tenderness in the left side of the throat when swallowing. He coughed much, expectorating a muco sanguinolent substance, and occasionally clear blood in considerable quantity, which temporarily gave relief from pain. His medical attendant, believing that he had to deal with an hypertrophied tonsil, attempted its removal, and did remove the larger part with a tonsillotome. Within a short time the pain increased, the muco-purulent expectoration appearing in augmenting quantities, until in a few weeks he was unable to sleep without opiates. He consulted Dr. Kinsler, who diagnosed epithelioma of the tonsil and referred the case to the writer for operation.

On inspection a hard, nodular, ulcerating, easily bleeding mass, occupying the site of the left tonsil, projecting toward the uvula and extending upward along the anterior and posterior pillars of the fauces to the soft palate, and downward to the margin of the epiglottis. This mass was lightly movable, very tender, and bled easily. On external palpation was found, immediately beneath the horizontal ramus of the jaw at its angle and extending forward nearly one third of its length, a hard ovoid mass the size of an English walnut, immediately adherent to the soft sublingual gland. Below this mass could be felt three hazelnut sized nodules.

The diagnosis of epithelioma of the left tonsil with involvement of the submaxillary lymphatics and the sublingual gland was confirmed.

Excision of the affected structures by an external route was determined and was done April 26, 1898. A strong silk suture was passed through the point of the tongue for the purpose of controlling this organ. A tracheotomy tube was at hand in case of necessity.

An incision was made, beginning at the mastoid process and extending downward to a point opposite the lower margin of the thyroid cartilage, and a second, beginning at the point of commencement of the first and extending forward along the lower margin of the horizontal ramus of the inferior maxillary to its middle point. This flap was, by rapid dissection, turned downward and forward, giving ample room for all manipulations. The external jugular vein was ligated between two ligatures and divided. On palpation a number of distinctly infiltrated glands were felt beneath the sterno-cleido-mastoid. This muscle was divided diagonally and its ends reflected, giving

easy access to the involved structures. By blunt dissection it was found that the glandular enlargements were intimately and firmly attached to the internal jugular and both internal and external carotids. The pneumogastric nerve was isolated and the vein and arteries ligated, greatly facilitating the extirpation of all the nodes, together with the sublingual gland, which was plainly involved. After an exact hemostasis the head was drawn toward the right, the tonsillar mass was seized from the wound with a four-pronged vulsellum forceps and pressure from the throat outward with the index finger of an assistant; the pharynx was opened with curved scissors and the mass rapidly clipped away. It was now possible to inspect the pharynx, and several remaining masses were easily clipped away. The hemorrhage was slight and easily controlled. No blood had entered the larynx. After copious flushing and swabbing an attempt was made to approximate the buccal and pharyngeal mucous membranes with strong catgut, but with only partial success. The deeper soft structures were coaptated with same suture material and the integument with a subcuticular silkworm gut. A gauze drain was placed in the lower angle of the wound. The external wound, except where the drain was placed, united *per primum*. Feeding through a stomach tube began the day following the operation. The gauze drain was removed on the third day. It soon became evident that a communication with the pharynx had formed by way of the drainage canal, air and fluids escaping through it, making deglutition impossible, necessitating an unusually long period of artificial feeding through the feeding-tube, about six weeks. The fistula gradually closed. The pharyngeal wound granulated slowly but completely.

During the first ten days after the operation, a great difficulty was experienced in preventing the insufflation of mucus and the secretions from the pharyngeal wound; several severe attacks of laryngeal spasm were exceedingly alarming. On the third day the patient suddenly discovered that his vision in the left eye was abolished. On examination by Dr. Harold Gifford, he found a choked optic disc, which he believed to be due to an embolus. The central retinal artery was blocked by an embolus or thrombus, more probably the latter, as the extreme edema of the disc made it probable that the posteiliary arteries also were blocked. It was also interesting to note that the tongue became atrophied on its left side, interfering somewhat with articulation. He continued to improve for nearly three months after his operation, when he was attacked with catarrhal pneumonia and died. No evidences of recurrence in the throat. He never, however, regained the power to swallow solid food; only thin liquids could be taken without the feeding tube.

In reviewing the technic present in our cases, it would seem that ample access to the diseased structures was obtained. The procedure is at best a severe and mutilating one. In the main the method followed in our cases was that of Cheever of Boston, who first removed a malignant tonsil by pharyngotomy. It seems that so extensive an operation as proposed and carried out by Czerny is hardly necessary. After a tracheotomy he made an incision, beginning at the angle of the mouth, extending downward to the anterior margin of the masseter muscle and thence to the level of the hyoid bone. The jaw was exposed and divided between the second and third molar teeth; the fragments were separated and the tumor removed, after requiring a section of the glosso-pharyngeal, hypoglossus, styloglossus and stylohyoid muscles and gustatory nerve. The bone fragments were reunited with silver wire. Nor does the method of Mikulicz seem necessary. He reflected a triangular flap as in our cases, the incision being very long. The jaw, after being exposed above its angle, was divided, and the ascending ramus resected, in order that better access to the gland might be had. We found that, after a thorough and extensive enucleation of all the cervical glands, whether visibly infected or not, after a division of the sterno-cleido-mastoid and its divided ends were reflected and hemorrhage carefully controlled, with a wide separation of the wound margins by retractors, and the head being strongly drawn to the opposite side, and strong traction downward of the arm and shoulder on the affected side being made, sufficient room was obtained for all necessary manipulations. In both of our cases the entire larynx and naso-pharyx could be inspected, so that a thorough removal of all affected tissues could be made under direct ocular inspection.

In neither of our cases was a preliminary tracheotomy necessary, chiefly because all hemorrhage was controlled and the dissection made to the mucous membrane before the pharynx was opened.

The loss of vision in the left eye of our second case was undoubtedly due to an embolus, but to state just how an embolus could reach the eye is not easy to solve. It is the first observation of this kind made by us, after many ligations of the common, internal and external carotids and jugular veins, in the removal of nearly every variety of neoplasms in the region of the neck.

THE WAX-PARAFFIN DRESSING.

Presented to the Section on Surgery and Anatomy at the Forth-ninth Annual meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY SAMUEL H. FRIEND, M.D.
MILWAUKEE.

The wax paraffin dressing, as announced in the *Medical News* of October 23, 1897, is a mixture of equal parts of unpurified yellow beeswax and hard paraffin.

Composition: Equal parts, by weight, of unpurified yellow beeswax and hard paraffin.

Preparation: Melt these substances together, preferably over a sand bath (though a water bath will also answer), and after melting keep them liquified for one-half hour to complete mixture. The specific gravity of yellow wax is between .955 and .967; the melting point 63 degrees to 64 degrees C. (145.4 degrees to 147.2 degrees F.) Hard paraffin has a specific gravity of .900, and a melting point at 43 to 65 degrees C. (109 to 151 degrees F.) The object of boiling the two substances together for one-half hour is to diffuse them as much as possible. By covering the mouth of the bottle with wire gauze or absorbent cotton the mixture will attain a higher temperature and produce a more equal diffusion. Ehrlenmeyer's flask is useful to hold the dressing, as the glass of this flask is thin and offers a large base to melt the mixture quickly, although any bottle may be used. Forty to fifty grams of the dressing will melt within four to six minutes. As already detailed, the specific gravities and the melting points of the wax and paraffin are not the same, and as the substances are never equally diffused, the paraffin melts first, so that the mixture should not be used until the entire mass is melted. Another point worthy of note is that immediately after the mixture is melted its temperature at the bottom of the bottle is 105 C., while the top is 122 C. This difference of the temperature lasts but two minutes, at the end of which time the bottom layer registers two to three degrees higher than the top. The dressing is either directly spread upon wounded surfaces or upon dressings of absorbent cotton or gauze.

Properties: This mixture is sterile. It is light in weight, cohesive, rigid, ductile, tenacious, adhesive, air, water and germ proof, and has an agreeable odor, and solidifies instantly. As it is a perfect nonconductor it retains an even temperature about the

wound and hastens regeneration. Never irritating the skin, it can be easily removed. Upon the slightest pressure from below it allows free drainage. It will hold in suspension almost all of the well-known antiseptic powders. It will cover and retain in contact with the skin and other surfaces all medication. It will adjust itself to any part of the body and form a rigid splint in conformity with the part. If used as a splint it will be easily and quickly cast and cut. It can be used upon gauze and absorbent cotton, increasing their usefulness. It adheres equally well to dry and to wet surfaces, and even to very wet surfaces. The heat retained in it is hemostatic and quickly forms a dry wound.

Physiologic action: When the mixture in the bottle registers between 121 and 160 degrees C. (250 to 320 degrees F.) and is quickly removed and applied by means of a swab or brush, it will burn tissue and so produce contraction. The thickness of the layer of dressing depends upon the temperature of the mixture when applied. The hotter it is, the thinner is the layer. This temperature of 121 to 160 degrees C. (250 to 320 degrees F.) should then be used only on bleeding points and when cauterization is required. When the temperature of the dressing in the bottle registers 122 degrees C. (252.6 F.), which temperature is reached when the mixture is completely melted, its action is dessicating and hemostatic, and there is produced within a few hours a dry wound with a firm scab. As the mixture cools rapidly in transferring, the heat of it is hardly felt. When the mixture in the bottle registers 88 degrees C. (190 degrees F.) it produces no sensation and can be used as a weak hemostatic and to protect the parts. After the first layer has been spread the temperature of the mixture is immaterial. Layer after layer can be added. At 65 to 75 degrees C. (149 to 167 degrees F.) it is still adhesive, but not hemostatic, and begins to harden on the side of the bottle.

Usage. Its usage is as follows: On operative and accidental wounds. I have used it after operating for abscesses on the neck, circumcision, after removal of small tumors on the cheek, and in cases of eczema. I have applied it after accidental cuts over the head and face, in cases of crushed and fractured fingers, using it both as a dressing and a splint; on contused wounds of the scalp, on burns, upon indolent ulcers of the legs, wounds to the ears; after operations for the removal of epithelioma of the lip.

WET DRESSINGS IN SURGERY.

Presented in Section on Surgery and Anatomy, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo, June 7-10, 1898.

BY THOMAS OSMOND SUMMERS, M.A., M.D., F.S.Sc., LOND.

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ST. LOUIS, MO.

This may well be called the *dressing period* in the evolution of surgery. Time was when the scapel alone was emblazoned on the escutcheon of the surgeon and with the skillful incision his responsibility ended, nor did the dignity of his office admit of his performing what then were held as the minor and menial offices of *after treatment* which then was supposed to cover everything that followed upon the first brilliant sweep of the surgeon's glittering steel. There are no doubt some who hear me today who remember the dramatic toss of the knife behind him of the elder Gross whon completing his incision and the autocratic delivery of the case to his assistants for the dressing and treatment of the wound.

Even to this day the red, white and blue stripes of the barber pole tell of surgery's humble origin and the bandagers and bone-setters still roam through the villages of England and the barber surgeons still apply the leech and cup for the more dignified practitioner. It remained for Sir Joseph Lister to break the spell of *otium cum digitate*, which was the bane of all surgical progress, and teach the autocrats of the scalpel that surgery meant much more to the organism than the mere solution of continuity along anatomical lines—that this indeed was the *avant courier* of the real principle from which all the almost miraculous achievements of modern surgery had been evolved.

It was my privilege to be present at the presentation to the British Association at Edinburgh in 1875, by Professor Lister, for the first time, of a clinical demonstration of his mode of surgical dressing, which opened to surgery new worlds to conquer. The case was one of ligation of the external iliac, and the elaborate dressings being removed proved the triumph of his principle, though his venerable colleague, Professor Spence, almost on the verge of eternity, threw a well-poised Parthian lance at the rising genius of modern surgery. Since that day every operation, however simple in itself, has been one in which the surgeon "earned his bread by the sweat of his brow." No turning over the case to the unwashed student, for he whose records of success are proclaimed today is the operator who leaves not his patient until the last jot and tittle of aseptic dressing has been fulfilled, for so exacting is this principle that *falsus in uno, falsus in omno* is the inflexible law of its operation.

As a matter of course with the increase of such labor, necessary as it has proved to be to insure surgical success, the ingenuity of man was set to work at once to simplify the methods without impairing the efficiency of aseptic surgery. So active has been the work in this field that apparatus of every device and design has been offered to the profession until its name is legion, and of making of dressings as the patriarch said of books, "there is no end." As in everything else the element of "fadism" or surgical "fashion" has been dominant even in this unesthetic field, and the very men who pretend above all others to contemn the follies of feminine fashion are themselves afraid to say their soul is their own when it comes to operating and dressing of wounds before their lynx-eyed professional rivals. For years past, for example, it had been almost as much as a surgeon's name was worth to apply oleaginous preparations to surface lesions, although the very first treatment of wounds of which we read recommends the "pouring of oil," and in the case of the good Samaritan received the endorsement of the Great Physician himself.

There are some things however that fashion can not forbid, and this is one of them; like Banquo's ghost "it *will* not down." Long before science had thrown its searchlights over the dark field of biogenesis, experience had taught the steel-clad warrior the virtues of Gilead's balm, and from the shades of Olivet, where fell the tears of Him who came for the healing of the nations, man had learned to gather the oil for his wounded body. Since the discovery of the bacteriologic processes of infection in open wounds there has been a gradually growing tendency to return

to the ancient remedial agents which experience dogmatically taught were rationally indicated. In the last edition of that eminently practical work upon surgery, by Wyeth of New York, we find this positive and significant utterance upon the use of oil and balsam, the first surgical dressings known to humanity: "I know of nothing equal to this valuable preparation. The oil acts in a two-fold way; the surface of the wound is moistened by it, while the liquid excretion from the wounded surface is carried off in the dressing by capillary attraction. The removal of moisture cripples the proliferation of the bacteria and in this way aids in antisepsis."

In the process of repair all the structural elements must be supplied from beneath the surface of the lesions so that the constructive metabolism would not be injured by the mechanical interference of the oil globules which, as intimated in the quotation just made, would "cripple the proliferation of bacteria," which comes from without. There are many wet dressings, which if frequently renewed show excellent results, but there are few cases which come before us in which disturbance of dressing does not do mechanical injury to the process of repair, besides exposing the wound to the entrance of pyogenic and other cocci while the dressing is being changed, while the retention of material which has expended its aseptic influence is a constant menace to the integrity of the organism at large. Lister was working to the overcoming of these difficulties when he devised his "paste" dressing, which however failed to meet the desired ends in many cases. The use of animal and vegetal oils is also open to the objection offered to solutions in dressings—the necessity of changing the dressings too often—but for a different reason, the tendency of the oils to become rancid: and this applies also to the keeping of such dressings prepared for use. Wyeth recommends in his oil and balsam dressing the sterilization of the oil before using, but admits that this is often impracticable and recommends in this case the use of plain, cold castor oil of the shops.

It is therefore clear that to carry out the idea of a practical dressing it must be:

1. Antiseptic. This applies not only to the effect of the application to the part affected, but to the corporate substance itself, thus insuring it against autoinfection before applying.

2. Permanent. This is necessary in order to avoid too frequent removals as well as to preserve itself from deterioration.

3. Non-irritating. There is nothing more delicate, more easily disturbed than the formative principles of tissue, so that care must be taken in the dressing of all lesions of surface lest the agents used should arrest the tender process of repair, as well as protect it from the invasion of destructive germs.

4. Constructive. While the majority of lesions, especially those of traumatic origin, if not interfered with by destructive germs, will heal rapidly of themselves, there are very many which require not only this negative condition but also a positive stimulation of function in the constructive elements of the part. Stimulation of cell growth however must not go to the extent of irritation, in which case there will be destruction instead of construction of tissue.

The fulfilment of these conditions has been the aim of the surgical pharmacist from the time when the first coccus wriggled across the field of the microscope and gave its first exhibition to the scientific investigator of its dance of death within the organism of man. But amid all this elaboration of apparatus it was to Sir Astley Cooper, after all, that the credit is due for his foreseeing therapy, leaping over as it were the dark chasm which separated the triumphs of his surgical pathology. It was he, who without the knowledge of the bacteriologic factor in the great problem of surgical treatment, by the intuition of genius gave to us the essential principles of external dressing for surface lesions. His formula, however, was open to the objection of violating one of the conditions herein laid down, that of permanence, in that lard was used instead of petrolatum, which has been since discovered, and is now substituted in the preparation known as ungentine, which is an ideal formula constructed along the lines of that suggested by Sir Astley Cooper but altered to the conditions of modern aseptic surgery. The irritating effects of the ordinary alum has also in some way been obviated, furnishing thus a typical dressing for surface lesions. For internal lesions that are to be immediately and permanently closed beneath the sutured integument, there are many valuable aseptic liquid preparations which we prefer to the too indiscriminate use of iodoform, aristol *et id omne genus*, but we are free to admit that for all external dressings we have found the highest fulfillment of modern aseptic or antiseptic surgery in the preparation just mentioned.

I am not sure whether this is a proprietary preparation or not, but this I do know, its formula is an ideal one and its results are certainly very satisfactory. It is about time we were looking around after labor-saving methods when we have to employ at the simplest incisive operations an extra attendant to wipe the sweat from our brows, as the houri fans the Sultan's heated cheek, though our attendants are not all houris nor are our cheeks fired with the congestion of a lazy passion. We are glad to see this unholy war against oleaginous applications coming to an end, just as we should be also glad to see the phlebotomy pendulum point to the nadir. In surgical politics I am a middle of the road man—*in medio tutissimus ibis.*

SURGERY OF THE LUNG.

The Oration in Surgery Delivered at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Col., June 7-10, 1898.

BY J. B. MURPHY, M.D.
CHICAGO, ILL.

(*Concluded from page 297.*)

Carron proposed to compress the lung over tubercular cavities with the hope that the collapse of the lung would be followed by an obliteration of the cavities. MacEwen favors resection of the ribs to allow the contraction of the chest over small cavities and the drainage and even curettement of large ones. Coromilas, Greece, favors pneumotomy and early surgical interference in tubercular processes.

If the adhesions be firm and the parietal and visceral layers can not be separated, then the parietal layer should be separated from its costal attachments and allowed to sink in with the lung, or it should be held compressed by a tampon beneath the flap for forty-eight to seventy-two hours. Will found that in thirty-six cases of tuberculosis in the early stage, thirty-two admitted of complete collapse of the lung and four only partial. If on examination it be found that the lung is free from adhesions, or that circum-

scribed adhesions exist, then the treatment is entirely different; the lung may be forced to collapse by the injection of a fluid which is slowly absorbed, as the mineral oils, alboline, etc., or better still, it may be compressed and retained compressed by the injection of nitrogen gas, after the method described for the determination of pleuritic adhesions. That this method is practicable, as far as its technique is concerned, I have demonstrated in the following cases. It can be given with little more pain than a hypodermic injection. The patients suffering from tuberculosis of the lung on whom I used this treatment are progressing favorably. We have had no postmortems to show the reparative effect upon the tubercular process. The radiographs show distinctly that the lungs remain compressed. The X-ray is of inestimable value in studying pathologic processes of the lung, particularly in the localization of cavities (see radiographs Nos. 5, 6 and 7). The degree of compression of the lung can be photographed and the rapidity of absorption of gas estimated by comparison of pictures (see radiographs Nos. 8 and 9). The outline of adhesions when gas is injected is pictured on the plate (see right side of radiograph No. 10). The following histories illustrate the method of injection and its effect:

Case 1.—Charles K., age 23, Cook County Infirmary, was admitted to the hospital April 30. He had suffered from tuberculosis of the right apex since November, 1897. Physical signs showed that it extended down to the lower margin of the third rib; there was no evidence of a cavity; tubercle bacilli were found in the sputum; patient had been coughing for three months; this was so frequent and persistent that he could not sleep. His temperature on the evening of his admission was 102 degrees. He had been having night sweats, was somewhat emaciated, and his appetite was poor. It was decided to immobilize the lung. One hundred and twenty cubic inches of nitrogen gas was injected in the sixth interspace after the method described above. The lung collapsed and he presented all of the signs of pneumothorax. The heart was displaced to the left five-eighths of an inch. The patient's breathing while on the table was a little rapid and the effort somewhat labored. He was up and about the room in five minutes and stated that he felt no distress whatever from the treatment. His cough was almost immediately relieved; he slept the following night without a coughing spell; during the day there was a superficial coughing effort to "clear the throat," as he expressed it. Eight days after the injection he came to my office and I examined him and found that the pneumothorax still existed. There was a small area of emphysematous crackling in the neighborhood of the puncture; distant tubular breathing could be heard; the patient's temperature had lowered to 99.7 degrees in the evening and was usually below normal in the morning. I had a radiograph of his chest made at this time. (See radiograph No. 8. Left side of plate was defective.) I have seen this patient every week since and his condition continues good. The last radiograph shows that but a very small quantity of the gas had disappeared, which I believe has escaped into the cellular tissue of the chest wall, as the area of the emphysema has increased.

Examination July 8. The pneumothorax had not diminished in the least. There was not a respiratory sound on the right half of the chest. The hepatic dulness was down almost to the margin of the ribs; the intercostal spaces bulged; there was a tympanitic percussion note over the right half of the thorax; the pulmonary quiescence was still complete. The patient had not coughed or expectorated a particle in five weeks; eats and sleeps well. He had had no fever and his temperature at 4:30 today is 98.2 degrees. He had not been weighed, although he feels that he has gained in weight. It is two months and a half since the injection was made and the quantity of gas is practically the same, showing that the absorption of the nitrogen is extremely slow indeed, if any of it is removed by that process.

Dr. Alexander C. Weiner and Dr. James G. Berry examined this patient with me.

Case 2.—E. L., male, age 34, Cook County Infirmary, was in the second stage of phthisis, with cavity in right upper lobe. Endeavor was made to fill the right pleural cavity with gas, but as adhesions were found it could not be accomplished. He was not in condition to withstand operation for compression of the chest wall. The gas entered the cellular tissue of the chest and remained there three weeks, showing how slowly it is absorbed.

Case 3.—H. A. E., male, age 30, Alexian Brothers' Hospital, admitted May 10, 1898. Family history shows several cases of tuberculosis. His cough and fever began about Oct. 1, 1897. Cough very severe, expectoration limited. Night sweats since January, 1898. There were physical signs of apical tuberculosis on the right side; patient gave no history of pre-existing pleurisy; he was placed on the table, trocar inserted in the sixth intercostal space, anterior axillary line and two hundred cubic inches of nitrogen gas was injected after method described above. It was found when the trocar entered the pleura that it required no pressure to force the gas into the pleural cavity. It produced very slight coughing and but little anxiety to the patient from shortness of breath; the pulse was increased in frequency to 96 and the lips were discolored a light blue; the apex beat was displaced one inch to the left, the hepatic dulness three inches downward; the respiratory sounds entirely disappeared on the right side; respirations were increased to 26. Patient was removed to his bed; thirty minutes later was sitting up in bed eating his dinner; he said "he felt a binding in the chest and a tickling sensation in the throat;" he remained in bed for two days, as his respirations were a little increased in frequency and he complained of some discomfort in the epi-sternal region. Radiograph No. 11 shows the compression of the right lung. Examined May 20. The respiratory sounds still absent; the cardiac displacement continues; there is still absence of the hepatic chest dulness; his respirations are normal and his cough has disappeared; no expectoration.

June 30 patient presented himself again for examination; he thought his breathing was still a little short. Cough has entirely ceased; he has had no night sweats; has gained ten and one-half pounds in three weeks; his appetite is excellent.

Physical examination: The respiratory sounds are returning, though still distant; there are no râles; the percussion note shows that the chest has still a considerable quantity of gas, the liver dulness is absent down to the margin of the eighth rib and the apex beat is in about the normal position. The mediastinal dulness is to the left of the margin of the sternum; there is some bulging of the intercostal spaces, though not so marked as in previous examinations.

Case 4.—P. C., male, age 23. Admitted to Alexian Brothers' Hospital six weeks ago. Patient was in second stage of tuberculosis of the right lung. May 12 an effort was made to inject the gas in the usual manner, but adhesions prevented the admission of the gas.

Case 5.—Alexian Brothers' Hospital, E. D., May 12. Patient in first stage of tuberculosis in the right apex; has had cough, expectoration, night sweats and fever since August, 1897; bacilli in the sputum; had frequent attacks of pleurisy. Method of injection of gas the same as in case 1. Puncture made in sixth intercostal space, mid-axillary line. When parietal pleura was penetrated the gas readily passed into pleural cavity; seventy cubic inches were injected. Physical signs of pneumothorax rapidly appeared; liver dulness displaced downward one and one half inches; apex beat displaced one-half inch to the left. Patient said he felt "his breath was shorter." The opening was sealed. In one-half hour the patient said he felt no inconvenience whatever from the injection, and was walking about the ward. He left the hospital a few days following his injection on May 12. I did not see him again until he presented himself for examination June 30. He was greatly improved in appearance; there was a slight cough, but no expectoration; he had gained in weight; his appetite was excellent.

Physical examination showed that there had been some absorption of gas, although a tympanitic sound was distinctly present over the former area of liver dulness. The respiratory sounds were feeble; there were no râles. Seventy cubic inches of gas was injected in the usual manner. It did not produce the slightest discomfort. After the injection the liver dulness was displaced almost to the costal arch. There was no displacement of the heart. There was some bulging of the intercostal spaces. Patient left the hospital immediately for his home.

July 7, at Alexian Brothers' Hospital two cases of apical tuberculosis were injected; in one 75 and in the other 80 cubic inches of gas was used; in neither was there the least discomfort from the insertion of gas; in a third case adhesions were found, making it impossible to succeed in the injection. The cases in which I believe this method

most practicable are apical or monolobar tuberculosis in the early stage, as the pathologic conditions are such that the compression of the lung can be accomplished and adhesions are not likely to be found. I do not consider that it is indicated nor practical in advanced nor chronic tuberculosis, as the fibrous tissue deposited in the lung will not permit compression of the lung, nor will the pleuritic adhesions allow of gas injection. So far no conclusion can be drawn as to the ultimate result of this treatment. Theoretically its dangers may be: *a*, hemorrhage from wounding the intercostal vessels; *b*, injecting gas into the intercostal vein, the possibility of which I question; *c*, infection by the use of impure gas, infected trocar or improper antiseptic preparation of chest; *d*, rupture of infected foci into the pleural cavity through compression of lung and separation of pleuritic adhesions; *e*, dyspnea from the use of too large quantity of gas: this can be readily relieved by changing the direction of the current in the siphon; *f*, puncture of the lung with the canula. This will not take place unless adhesions are present, and if the lung should be punctured it is a matter of no consequence, as experiments and clinical experience show that the lung can suffer great traumatism without danger. While these possibilities of danger are mentioned, none of them occurred in my experiments. I believe the gas should be reinjected every six to ten weeks as might be deemed necessary in the individual case depending upon the amount of absorption. If the respiratory sounds return the injection should be repeated. So far I have repeated the injection in but one case.

Technic of injection.—The point of insertion of the trocar varies somewhat in the individual case. If the apex of the lung be the seat of the lesion, the trocar should be inserted below the fourth interspace and back of the mid-axillary line. The best point is in the fifth interspace at the anterior axillary line. If it be a middle or lower lobed tuberculosis, the injection should be made over the upper lobe, preferably in the third interspace just outside the mammary line. The chest wall should be thoroughly cleansed and rendered aseptic. Chlorid of ethyl should be used for local anesthesia. A tenotome puncture should be made through the derma; this allows the trocar to be easily inserted. The stilette in the trocar should be withdrawn when the rib is reached; the gas should now be turned on; the trocar should then be pushed inward, hugging the margin of the rib. When the parietal pleura is punctured the trocar advances rapidly and the gas begins to flow freely into the cavity unless adhesions exist. If adhesions be present the gas will not flow. The trocar should be taken out and inserted in the same manner in another position.

The quantity of gas to be injected will vary considerably and should range from 50 to 200 cu. in.; the amount to be given in each case will be regulated by the symptoms—distress, dyspnea and the displacement of the mediastinal contents and diaphragm. The respiratory sounds on that side should be suppressed unless too great dyspnea is produced. If the patient's discomfort is great the current of gas can be reversed until relief is obtained. The trocar should then be withdrawn, the wound sealed with collodion and a moderately firm cotton compress placed over the puncture. The compress is to prevent the escape of gas from the pleura into the subcutaneous cellular tissue. The lung should be kept quiescent from three to six months or even longer, depending upon the symptoms. When the lung re-expands, if there be evidence of active tuberculosis, the injection should be repeated; also when the respiratory sounds return the injection should be repeated, that is, the quiescence must be maintained to have the treatment effectual. During the treatment the hygienic surroundings of the patient should be the most favorable; his diet should be wholesome and nutritious.

Preparation of the nitrogen gas.—The nitrogen gas used on my patients was prepared by Prof. John A. Wesener of the Columbus Medical Laboratory, in the following manner: Compressed air was allowed to pass slowly through a solution containing pyrogallic acid and potash; this solution absorbed the oxygen, the nitrogen thus obtained was purified by washing it through potash and then through sulphuric acid; it was then collected in a rubber gas bag which had been sterilized with a 5 per cent. carbolic acid solution. It may be retained in the gas bag or stored in a small metallic cylinder.

APPARATUS.

A properly constructed apparatus should provide means for noting the escaping gas and measuring its volume in cubic inches. The appliance shown in the accompanying illustration consists of a gas bag for storing the gas, a graduated bottle in which the passing gas may be measured, and a reservoir for securing hydrostatic pressure by means of which the gas may be forced into the pleural cavity.

The measuring bottle is supplied with a three-way stop-cock, one to connect with the gas bag, one with the reservoir, and a third with the trocar. One of these stop-cocks terminates in a tube extending to the bottom of the bottle, this cock being connected with the reservoir. It will thus be seen that if the measuring bottle be filled with water and the reservoir bottle be placed slightly above it, the water may be forced into the latter by slight pressure on the nitrogen bag. After replacing the water with the gas, the former may be used as hydrostatic pressure to force the gas into the cavity.

The trocar selected is of the Emmett type, one that may be attached to the bottle before its introduction. It consists of a straight canula to which is joined at a point near its proximal end a side tube, with which the connection is made with the bottle. This tube forms a bifurcation in the lumen of the main canula. A suitable packing is closely pressed around the trocar shaft, so that when the perforator is withdrawn the point will rest within the chamber at its proximal end, forming an air-tight joint. The one I prefer is No. 7, French scale.

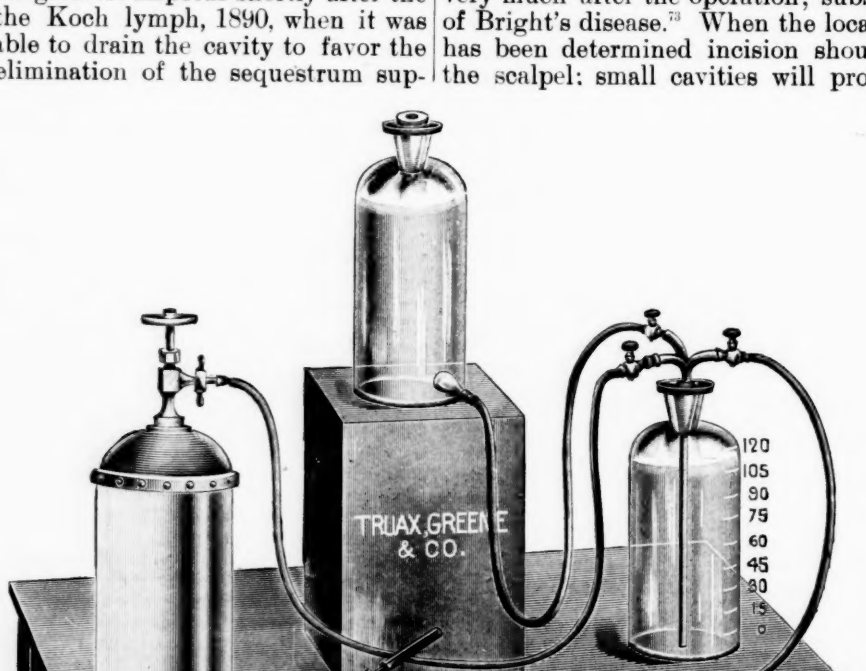
Directions.—Fill the graduated bottle with sterilized water and close it with the three-way stop-cock, securely fastening the latter in place and closing all the cocks.

Place the reservoir or douche bottle on a box or shelf at such a height that the bottom of it will be on a level with the three-way cock in the graduated bottle. This height may be varied according to the pressure desired. Connect this bottle with that branch of the three-way cock that terminates in the rubber tube leading to the bottom of the graduated bottle.

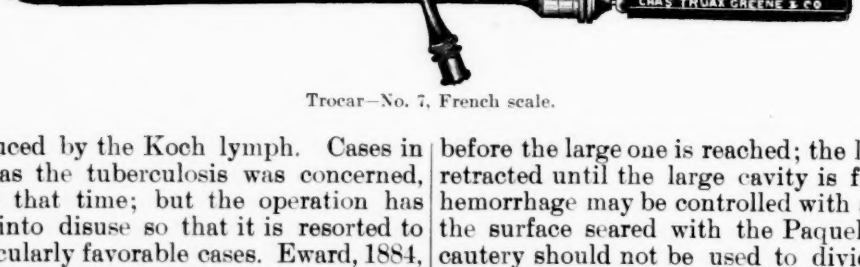
Fill the gas bag with nitrogen gas and connect it with one of the other stop-cocks. Attach the trocar to the longest of the three pieces of rubber tubing and connect it with the remaining stop-cock. Open the two stop-cocks leading to the upper bottle and gas bag. Slight pressure on the latter will force the gas into the graduated bottle and the water from the latter into the reservoir. Continue this pressure until the gas fills the bottle down to the zero mark. Close the stop-cock leading to the gas bag and open the stop-cock leading to the trocar until a small quantity of gas has escaped, thus displacing the air within the tube. Close the stop-cock and introduce the trocar, after which open the stop cock permitting the gas to pass through the trocar. The water pressure in the reservoir, if the trocar be properly introduced, should force the gas into the pleural cavity, the water gradually replacing the escaping gas. By watching the graduated scale the amount of gas indicated may be accurately noted.

Incision and drainage of tubercular cavities.—Phthisical cavities have been recognized for centuries. Two very interesting accidental drainages of tubercular cavities are referred to by many writers on diseases of the lungs. One is the case of Pheracus, who was

suffering with disease of the lung, and believing he was beyond cure placed himself in the front of battle and received a spear thrust which opened his pulmonary cavity and restored his health. Another was a case by De Bligny, 1679: the son of M. de la Genevraye, who was suffering from phthisis, received in a duel a sword wound in the right side between the fourth and fifth ribs; there was an abundant purulent evacuation from the wound; after the accident he completely recovered. In both of these cases, which appear mythical though true, there is nothing definite known of the nature of the abscesses, Paget has placed them as tubercular. The operation for drainage of tubercular cavities received its greatest impetus shortly after the introduction of the Koch lymph, 1890, when it was considered desirable to drain the cavity to favor the exfoliation and elimination of the sequestrum supposed to be produced by the Koch lymph. Cases in extremis, as far as the tuberculosis was concerned, were operated at that time; but the operation has gradually fallen into disuse so that it is resorted to now only in particularly favorable cases. Eward, 1884, considered the drainage of tubercular cavities curative as well as palliative, but cited no cases. The greatest barrier to surgical treatment is the difficulty of diagnosis and localization of the cavity. Physical signs, as auscultation and percussion, usually indicate the cavity at a greater distance from the hilum than it really is; this is particularly true of cavities in the lower lobe. The radiograph is of great assistance in determining the location of the cavity, as can be seen in those herewith reproduced; accurate pictures should be taken before every operation. (See Radiographs v, vi, vii.) The cavity having been located and if the drainage is all that is intended a small portion of the rib may be removed over the site of the cavity and the cavity opened; this I do not consider the best practice; four to six inches of at least three ribs in the neighborhood should be removed to allow collapse of the chest wall as cicatrization and contraction of the cavity take place after drainage. The parietal pleura should be separated from the ribs before incising it. Palpation of the area aids materially in the location of the cavity; digital exploration after incision of the lung should be favored in tuberculosis. As early as September, 1873, Mosler incised the pleura and worked his way through the lung to a cavity by dilating the tissue with an artery forceps. The patient improved very much after the operation; subsequently he died of Bright's disease.[73] When the location of the cavity has been determined incision should be made with the scalpel; small cavities will probably be opened before the large one is reached; the lung can be gently retracted until the large cavity is freely incised; the hemorrhage may be controlled with a catgut suture or the surface seared with the Paquelin cautery. The cautery should not be used to divide the lung, as it prevents inspection of the divided tissues and makes it uncertain when the cavity is reached. The entire cavity should be packed with iodoform gauze, which should be allowed to remain for several days. A drainage tube may then be inserted or the gauze packing repeated. Failure to find the cavity has frequently occurred. The ultimate result of drainage of tubercular cavities has been very unsatisfactory, which might be expected from a knowledge of the pathology of the diseased stage of cavern formation. The cavities are often multiple and only one is drained by the operation, and the tuberculosis continues its usual



Apparatus for injection of the gas.



Trocar—No. 7, French scale.

[73] Berliner Klin. Woch., 1878, xliii, p. 509.

course in the other portions of the lung. The rapidity of amyloid degeneration of other organs may be somewhat retarded by the drainage; in a number of cases pulmonary fistulæ remain. In 1890 I saw Hahn do a number of these operations and subsequently use the Koch lymph; at that time he reported that from his observations the results would not be satisfactory. Sonnenberg, in 1891, reported good results from this treatment. Kecke opposed the operation and quoted six cases of tuberculosis operated by Cerenville[74] with five deaths. His personal cases were anything but satisfactory. Jaenfert[75] named certain conditions contraindicating operations on tubercular cavities: 1, tendency to hemorrhage; 2, the danger of pneumothorax; 3, drainage does not remove the original disease, and operations under these conditions give a great mortality. Truc reports 18 cases with 6 deaths within three months after the operation. Poissier and Jannesco collected 29 cases and showed 10 deaths, 15 improvements and only 4 recoveries. Hofmokl reports 5 cures after treatment of tubercular cavities by operation. Douglas Powell opposes the drainage of tubercular cavities on the grounds: 1, that the cavities are fairly well drained, situated as they are in the apex; 2, the cavities are not often single with an activity of symptoms; 3, that excavation in phthisis is a conservative process. The latter statement is misleading; true, the excavation is a conservative process, but the absorption of the products of mixed infection subsequently retained in the cavity is distinctly injurious to the entire organism; this is the principal reason for the drainage of the cavity. Patients rarely ever die from simple tuberculosis of any part of the body, and particularly from simple tuberculosis of the lung, it is the mixed infection which causes the great fatality. Tubercular cavities in the lower lobes are more easily drained, should give better results after drainage, and are more fatal when not drained than cavities in the upper lobes. The former points are emphasized by the case reported by N. Pendleton Dandridge[76] in his able article on the treatment of pulmonary cavities. While drainage of large tubercular cavities has not given satisfactory results as far as cure is concerned, I feel it is the surgeon's duty to resort to this operation very frequently as a palliative measure, as it relieves these great sufferers of their most distressing symptoms, viz.: cough and expectoration.

The following case illustrates the operation and course of cases after drainage of tubercular cavities:

J. M. C., aged 46, Cook County Infirmary, has been suffering from symptoms of tuberculosis for 10 months. He has emaciated to a great degree; has had severe night sweats, afternoon hectic flushes; he expectorates large quantities of purulent material with spasmodic attacks of coughing; one or two hours may pass without coughing, then he will get a severe spell and an ounce or more of pus will be expectorated, the odor of which is not particularly offensive. Examination reveals râles over upper lobe of right lung, extending down to the fourth rib; bronchial breathing, absence of normal respiratory sounds; a cavity can be located under the second rib, two inches to the right of the sternum, and extends from upper margin of the second to upper margin of the third rib; its transverse diameter appears to be about one and one-half inches.

Operation Dec. 12, 1897. It was decided to open and drain the cavity; a U-shaped incision was made extending from the first to the middle of the third rib, one inch to the right of the sternum. The incision was then curved upward and outward to the anterior axillary border; sub-periosteal resection of about three inches of the second and third ribs was made; the parietal pleura was separated from the chest wall to the extent of about an inch around the field of operation; the exploratory puncture was now made for the first time and pus withdrawn. A horizontal incision was made in the pleura over the center of the cavity; adhesions were present, and the incision continued about one and one-half inches in length, until the cavity was reached, which was opened at a depth of about one inch; the hemorrhage was not profuse, and was readily controlled by pressure; a digital examination of the cavity showed that it was about two inches in diameter with an irregular surface; it was packed with iodoform gauze; there were a number of smaller bronchietatic cavities opened in making the incision and a few caseous bronchial glands were removed from the mediastinal margin; the packing was removed in fifteen minutes; there was still some oozing, which was controlled by the Paquelin cautery. The cavity was repacked with iodoform gauze, and the flap was accurately sutured around the gauze drain; chloroform narcosis. The patient was not in the least shocked by the operation; the highest pulse rate following was 92; the temperature on the third day was 100.6 degrees; after the fifth day it did not exceed 99 degrees. He expectorated a bloody mucus for the first three days. He had no "fits of coughing" after the operation; the packing was removed on the fifth day and a soft rubber drain inserted; he was allowed to be up and about. There was a primary union of the flap except at the point of drainage. The drain was allowed to remain in for five weeks; it was then removed, as a fistulous canal had been established. His cough is reduced to a minimum, the discharge from the fistula is of a non-purulent mucous character, and while the fistulous opening is large the quantity of discharge is small. He has gained in weight, his night sweats have ceased, and his general condition is greatly improved. May 30, Dr. Johnson, Medical Director of the Infirmary, reports that the communication of the sinus with the cavity has closed, and that a small granulating surface remains at the external opening.

I have collected reports from the literature as follows: Tuberculosis of lung operated, 47; incision and drainage, 34; pneumectomy, 2; thoracoplasty, 5; puncture and drainage, 2; opening of superficial abcess, 4; recoveries, 26; recovery with fistula, 2; deaths, 19; 12 from undetermined causes; 1 multiple gangrenous foci; 1 acute miliary tuberculosis; 3 hemoptysis; 1 hemorrhage; 1 cachexia.

Pneumectomy for the removal of a part or a complete lobe of the lung for a tuberculous disease has been one of the triumphs of surgical technique, but so far the clinical results have been unsatisfactory. From the experiments of Gluck, Schmid, Bloch and Biondi,[77] we we were led to believe that pneumectomy as a curative method for tuberculous lesions of the lung would become an accepted surgical procedure; however, our hopes have not been realized. While the operation of removal of a complete lobe of a lung has been successfully performed the number of deaths following pneumectomy has been so large that the operation has been practically abandoned. The technique of pneumectomy will be given under the heading of Pneumectomy for Neoplasms.

Kronlein in 1884 operated on two cases of apical tuberculosis; one lived but a few hours after the operation, the other but a few days. Ruggi, 1885, operated on two cases; one died on the ninth day from carbolic poisoning, and the other thirty-six hours after the operation. In 1891 Tuffier removed a small portion of the right apex through the intercostal space for tuberculosis; the patient made a good recovery and four years later was enjoying excellent health. In 1893 Mr. D. Lowson operated successfully on a woman 34 years of age for tubercular disease of the right apex. Doyen, 1895, also successfully removed a small portion of a lung for tuberculosis. Kronlein and Lowson give definite rules for the operation, the latter favoring the H or U-shaped incision, removing the second, third and fourth ribs from the sternum to the axillary line; this gives a large opening

[74] Muench. Med. Woch., 1891, xxxviii, p. 399.
[75] Muench. Med. Woch., 1891, xxxviii, p. 6.
[76] Ann. Surgery, xix, p. 134.
[77] Ber. Med. Woch., Vol. xviii, p. 645, 1881.

TUBERCULAR CAVITIES—1878 TO 1898.

No.	Bibliography.	Sex, Age.	Nature of Disease.	Duration	Etiology.	Location.	Signs of Cavity.
1878							
1	Williams, B., Med. J. R., 1878, Vol. 101	M. 28 yrs.	Pulmonary tuberculosis, many cavities, 6 mos.	6 mos.	Fever, much expectoration, vomiting fetid sputum.	Left side, predominating at base.	Signs of cavity.
1879							
2	Sadler, Lancet, 1879, Vol. 1, p. 84.	M. 38 yrs.	Tubercular cavity.	4 yrs.	Fever cachexia.	Left base.	Signs of cavity.
1882							
3	Sommerfetd, Hosp. Studende, 1882, No. 17, p. 257.	M. 31 yrs,	Progressive phthisis.	. . . .	. . . . .	. . . . .	Large cavity in right upper lobe.
4	Bull. M. World Med. Archives, 1882, Vol. 1, No. 26.	M. 29 yrs.	Circumscribed pneumothorax with underline tubercular cavity.	. . . .	. . . . .	. . . . .	. . . . .
1883							
5	Bull. Centr. F. Chirurgie, 1883, p. 104	M. 29 yrs.	Tuberculosis of left apex. 3d stage.	. . . .	Cough, expectoration, hectic fever.	In 1st and 2d intercostal space anteriorly.	Signs of cavity.
1884							
6	Spencer Wells, Brit. Med. Jour., 1884, Vol. 1, p. 1117.	M.	Tubercular cavity with axillary abscess.	. . . .	Axillary abscess with signs of cavity of right apex.	Right apex.	Signs of cavity.
1885							
7	De Trerville, Revue Medicale de la Suisse Romande, 1885, p. 463, Obs. 4.	F. 15 yrs.	Advanced tuberculosis of both apices.	2 or 3 years.	Hectic fever.	Left apex, clavicle to 4th rib.	Signs of cavity.
1885							
8	Frainkel in Truc thêse de Lyon, 1885, p. 78.	M.	Advanced pulmonary tuberculosis.	. . . .	Hectic fever.	Apex 2d intercostal space.	Signs of cavity.
1885							
9	Truc th. de Lyon, 1885, p. 79 .	M. 38 yrs.	Pulmonary tuberculosis.	. . . .	Sudden and severe pains under the right clavicle.	Right apex anteriorly.	. . . . .
1885							
10	De Cereville, Rev. Med. de la Suisse Romande, 1885, p. 463, Obs. 3.	F. 40 yrs.	Pulmonary tuberculosis, 3d period.	. . . .	Hectic fever, cachexia.	Left base.	Signs of cavity.
1887							
11	Breen, proc. of Phil. Co. Med. Soc. 1887, Vol. 8, p. 203.	M. 27 yrs.	Tuberculosis with cavity.	. . . .	Cough, expectorated much sputa and pus. T. B. C. present, a septic temperature.	Lower left pulmonary lobe.	Signs of cavity.
1887							
12	De Cerruville, Archive Gen. de Med., 1887, Vol. 20, p. 477.	F. 40 yrs.	Abdominal phthisis with large cavity.	. . . .	. . . . .	Left summit.	. . . . .
1887							
13	De Cerruville, Obs. 5	F. 25 yrs.	Tubercular infiltration of left upper lobe.	4 yrs.	. . . . .	Left apex.	Signs of cavity.
1887							
14	Sezary et vicent Revue de Medicine, 1887, p. 675.	M. 48 yrs.	Pulmonary cavity, probably tubercular.	. . . .	Pleuro-pneumonia. Hemoptysis.	Right base posteriorly.	Signs of cavity.
1890							
15	Denison, I., period. of Am. Med. Ass'n, 1890, in Centralblatt f. Chir., 1890, p. 791.	M. 26 yrs.	Pulmonary tuberculosis.	. . . .	. . . . .	Base.	. . . . .
1890							
16	Tillman's. Brit. Med. Jour., 1890, Vol. 1, p. 1363.	M. 28 yrs.	Tuberculosis of left lung, especially empyemia in lower two-thirds of left lung, several fistuli in left chest wall, heart displaced to right side, right lung comparatively healthy left sided empyemia began Oct. 15, 1885.	. . . .	. . . . .	Left side.	. . . . .
1890							
17	Spengler, Verhand de geselsch d Naturforschen Aeuztzubremen, 1890, Vol. 1, p. 237, in Quincke, loc. cit. obs. 2, p. 241.	F. No age.	Bilateral pulmonary tuberculosis.	Several years.	Cavity of left apex, partial pyo-pneumothorax.	Left apex.	Signs of cavity.
1891							
18	Caselli baceoglitose medic., 1891, T. 11, 5th series, p. 235.	M. 31 yrs.	Tubercular broncho pneumonia cavity of right apex.	. . . .	. . . . .	Second intercostal space anteriorly.	Signs of cavity.
1891							
19	Krecke, Mun. Med. Woch., Vol. 38, p. 400, 1891.	33 yrs.	Tuberculous cavity.	. . . .	Septic fever chills.	Right lower lobe.	Signs of cavity.
1891							
20	Kurz, Wiener Med. Presse, 1891, p. 1389.	M. 30 yrs.	Tuberculosis of lungs, large cavities.	. . . .	Expectoration, fever, cachexia.	Left apex, anteriorly.	Signs of cavity.
1891							
21	Krecke, Munchen Med. Wochensche, 1891, p. 399.	M. 57 yrs.	. . . . .	. . . .	. . . . .	Right base.	Signs of cavity.
1891							
22	Hahun, 20th Cong. of German Society of Surgeons.	F. 22 yrs.	Cavity of left apex size of an apple.	. . . .	Purulent and fetid expectoration.	Apex anteriorly.	Signs of cavity.
23	Lesser, Munch. Woch., Feb. 24, 1891.	F. 43 yrs.	Tuberculosis with cavity at left apex symptoms had existed 4 years.	4 yrs.	. . . . .	Left apex.	Signs of cavity.
1891							
24	Lesser.	Same as 23	except cavity was smaller.				

TUBERCULAR CAVITIES—1878 TO 1898.

Pleural Adhesions.	Puncture.	Incision.	Results. Immediate.	Results. Final.	Necropsy.
No adhesions.	Puncture in the 7th interspace, pneumothorax and subcutaneous emphysema. 2 pints of fetid pus, lavage.	. . . . .	Considerable amelioration 6 mos. later.	. . . . .	. . . . .
Adhesions.	. . . . .	Incision in 10th interspace without resection of rib opening of a small cavity with the finger. Drainage.	Death 14th day.	. . . . .	Large cavity in left base not opened.
. . . . .	. . . . .	Puncture of cavity with trochar coarse, drainage.	No influence on general condition.	Death in 28 days after operation.	. . . . .
. . . . .	. . . . .	Thorocotomy and with forceps bored into lung, cavity was reached.	Patient died 7 days after operation.	. . . . .	. . . . .
Adhesions.	Puncture made, blood.	Pneumotomy.	Death on 6th day.	. . . . .	Partial pneumothorax, a large superficial cavity in left lung.
. . . . .	. . . . .	Incision of axillary abscess, issue of pus and gas. The liquid discharged is similar to the expectorate of the patient.	Recovery.	Recovery without fistula.	. . . . .
Adhesions.	. . . . .	Resection of 8 cm. of 2d left rib, exploratory puncture, removal of purulent and bloody fluid. Pneumotomy, opening of cavity.	Recovery. Observation 15 days after recovery.	. . . . .	. . . . .
. . . . .	. . . . .	Pneumotomy, drainage, insufflation, iodin and phenol.	Death, Hemoptysis.	. . . . .	Purulent cavity with granulatous wall.
Adhesions.	. . . . .	Pneumotomy, discharge of pus, air and gangrenous debris, drainage.	Death 15th day. Pains increased after operation.	. . . . .	Bilateral tuberculosis, cavity opened.
. . . . .	. . . . .	Thorocoplasty, resection of 5th rib to obliterate cavity which was not opened.	Death 14 days later.	. . . . .	No necropsy.
Pleural adhesions.	Negative puncture. Incision, trocar introduced into cavity.	Resection of 1 and 1½ in. of 9th rib just within a line drawn from angle of scapula, small drainage introduced, next day 1 oz. of pus escaped, opening dilated and several oz. of pus escaped.	Recovery.	Steady improvement since operation.	Temperature normal.
. . . . .	. . . . .	Resection of 3d rib.	Death 15 days after.	. . . . .	. . . . .
Adhesions.	. . . . .	Resection of 3 cm. of 2d and 3d ribs. Pneumotomy opening of a cavity situated behind the clavicle.	Death 45th day.	. . . . .	Acute general miliary tuberculosis.
Pleural adhesions.	Exploratory puncture, positive.	Resection of 2 cm. of 9th rib. Pneumotomy, a cavity the size of an orange, opened and drained.	Death 7th day.	. . . . .	Single cavity opened, tuberculosis of right apex more recent, tubercles in left lung.
. . . . .	. . . . .	Resection of 6th and 7th ribs. Pneumotomy, injection of vaselin and salol.	Recovery, amelioration 4 months later.	. . . . .	. . . . .
Left pleural firmly adherent in upper one-third.	Puncture 1 month after onset of empyemia.	Thorocotomy Sept., 1886, and Jan., 1888, with resection of piece of rib in lower and hind part of thorax. In April, 1888, extensive rib resection from 2d to 6th rib on left side in front, and 7th to 9th rib, left side behind. On May 27, 1888, front of chest wall resected from 2d to 6th rib, close to the sternal border. Breadth of resection 5 cm. above and 12 cm. below, left pleura tuberculous and right lung phthisical, large as man's fist, firmly adherent at 1st rib, left lung partly covered by pedunculated skin flap.	Organs shrank after last operation and tuberculosis of lung underwent process of spontaneous cure as a result of shrinkage.	Patient discharged as cured July 23, 1888.	. . . . .
No adhesions.	. . . . .	Thorocoplasty, cavity not opened.	Recovery.	Cured 7 mos., disappearance of signs of cavity of left apex, the right apex not operated upon, healed equally well.	. . . . .
Adhesions.	. . . . .	Resection of 8 cm. of the 2d left rib. Exploratory puncture, removal purulent and bloody fluid. Pneumotomy, opening of cavity.	Recovery 15 days after operation.	. . . . .	. . . . .
Pleural adhesions present.	. . . . .	Resection of ribs. Pleura opened with blunt instrument, lung over cavity was punctured, free opening made, cavity packed with iodoform gauze.	Fever fell after operation, considerable secretion, improvement after operation so patient could leave bed, sudden hemoptysis set in and caused death.	. . . . .	. . . . .
No adhesions.	. . . . .	Incision in the 2d intercostal space, pneumothorax. Pneumotomy, injection of iodoform.	Pneumothorax absorbed in 6 days, recovery without fistula, cavity measured 12 p. m. in diameter.	Death 3 years later, general tuberculosis.	. . . . .
. . . . .	. . . . .	Rib resection. Pneumotomy, iodoform tamponade.	Death. Hemoptysis.	. . . . .	. . . . .
. . . . .	. . . . .	Incision at level of upper border at 3d rib. Pneumotomy without rib resection, amelioration. Injections of Koch's tuberculin.	. . . . .	. . . . .	. . . . .
Pleural adhesions.	. . . . .	Incision in 1st interspace 7 cm. long, trocar introduced, cautery used to penetrate lung cavity size of apple, walls curetted and packed with antiseptic gauze, Koch's tuberculin injected and caused increased discharge.	. . . . .	Patient was much improved in general health, cavity dwindled down to 1½ its normal size.	. . . . .

TUBERCULAR CAVITIES—1878 TO 1898.

No.	Bibliography.	Sex. Age.	Nature of Disease.	Duration.	Etiology.	Location.	Signs of Cavity.
1891 25	Sonnenburg, 21st Congress of German Surg. Soc., April, 1891, and in Quincke and trenzgelhet, 1896, Vol. 1, p. 240, Obs. 4.	M. 56 yrs.	Bilateral pulmonary tuberculosis more marked upon right side, lesions far advanced in right lung, less so in left, numerous bacilli.	. . . .	. . . . .	Right apex anteriorly.	Signs of cavity.
1891 26	Sonnenburg, Quincke, loc. cit., Obs. 5.	M. 43 yrs.	Tuberculosis of both apices, predominating in left. Two lesions in right.	. . . .	Emaciation and fever.	Left apex anteriorly	Signs of cavity.
1891 27	Sonnenburg, loc. cit., Obs. 6.	M. 44 yrs.	Tuberculosis of both apices, predominating in left.	21 mos.	. . . . .	Left apex anteriorly.	In left apex only.
1891 28	Sonnenburg, loc. cit., Obs. 7.	M. 35 yrs.	Bilateral pulmonary tuberculosis, predominating in right lung.	18 mos.	. . . . .	Right apex anteriorly.	Signs of cavity.
1892 29	Roux, Revue Med. de la Suisse romande, 1892, p. 567.	. . . . .	Tubercular cavity located posteriorly under the scapula and inaccessible from behind.	. . . .	. . . . .	Right lung under scapula.	Signs of cavity.
1892 30	Roux, ibid., 1892, p. 567. . . .	F.	Large tubercular cavity.	. . . .	. . . . .	Right base.	. . . . .
1893 31	Lowson, Brit. Med. J. In N. Y. Rec., April 15, 1893, Vol. 43, p. 668. Brit. Med. J. June 3, 1893.	F. 34 yrs.	Tuberculosis of right apex.	. . . .	Dyspepsia, night sweats. Pain over top of right lung to back, cough.	Apex of right lung.	. . . . .
1893 32	Shurly, J. of M. M. Ass'n. 1893, 21, p. 297, Obs. 1.	M. 48 yrs.	Tuberculosis of both apices. Hepatization in left, cavities in right. Duration several years.	Several years.	Fever, emaciation, abundant expectoration.	Right apex.	Signs of cavity.
1893 33	Shurly, ibid., 1893, 21, p. 297, Obs. 2.	M. 27 yrs.	Bilateral pulmonary tuberculosis, 3d period, cavity in left lung.	. . . .	. . . . .	. . . . .	Hectic fever, multiple cavities, one large cavity in the left lung and disseminated.
1893 34	Voge, Med. and Surg. Rep. Phila., Dec. 31, 1893.	F. 28 yrs.	Pulmonary tuberculosis.	. . . .	Superficial abscess beneath scapula.	Base posteriorly.	. . . . .
1894 35	Dandridge, D. P., Ann. of Surg., Vol. 19, 1894, p. 129.	M. 29 yrs.	Tuberculosis of lungs.	. . . .	. . . . .	Right lower lobe.	No posterior signs.
1894 36	Parrier, Soc. de Chirurgie, 1894, p. 630.	. . . . .	Abscess of thoracic wall communicating with lung cavities in a tubercular subject.	. . . .	. . . . .	. . . . .	. . . . .
1894 37	Truc th. de Lyon.	M. 47 yrs.	Pulmonary tuberculosis and fistulous tract opening, 4 fingers' breadth outside of nipple.	2 yrs.	Suppurating fistula.	Right apex.	. . . . .
1895 38	Doyen, Cong. de Chirurgie, 1895, p. 105.	. . . . .	Pulmonary tuberculosis, 3d stage.	. . . .	. . . . .	. . . . .	Signs of cavity.
1895 39	Michaux, Congres Francais de chirurgie, 1895, p. 94.	F. 26 yrs.	Tuberculosis of right lung, multiple foci.	. . . .	. . . . .	Right base behind.	Signs of cavity.
1895 40	Michaux, Congres Francais de Chirurgie, 1895, p. 94.	F. 28 yrs.	Tubercular cavities.	. . . .	Profuse expectoration.	Right base behind.	Signs of cavity.
1895 41	Salmoni, Clinicea Chirurgiea Milano, 1895, p. 65.	M. 34 yrs.	Pulmonary tuberculosis following upon an old pleurisy.	. . . .	Cough, expectoration, hectic fever, retraction of thorax.	Left base.	No signs of cavity.
1895 42	Tuffier, L'Abeille, Med. Par., Oct. 28, 1895.	M. 20 yrs.	Tuberculosis of apex of right lung.	. . . .	Tubercle bacilli found in sputum.	. . . . .	. . . . .
1896 43	Quincke, Mittheilunger, A. D. Grenzge bieten der med. in Chir., 1896, 1, p. 240.	M. 46 yrs.	Tubercular infiltration of right lung.	2 yrs.	Hectic fever.	Right apex anteriorly.	Signs of cavity.
1896 44	Bier in Quincke, Mittheil a. d. Greuzgeliche, 1896, 1,	M. 26 yrs.	Cavity of the right apex.	. . .	Frequent hemoptysis, retraction of thorax.	Right apex.	Signs of cavity.
1896 45	Maffert, Brit. Med. Jour., 1896, p. 392.	M. 19 yrs.	Chondro-sterno-costal tuberculosis and pulmonary tuberculosis.	. . . .	Symptoms of purulent pleurisy.	Left base.	No signs of cavity.
1898 46	New York Med. News. D. Tait and Abrams, Feb. 26, 1878, p. 263.	M. 7 yrs.	Acute tuberculosis.	. . . .	Previous croupous pneumonia, night sweats, progressive emaciation.	Lower lobe of left lung, upper portion.	. . . . .

TUBERCULAR CAVITIES—1878 TO 1898.

Pleural Adhesions.	Puncture.	Incision.	Results.		Necropsy.
			Immediate.	Final.	
Adhesions.	. . . . .	Incision parallel with clavicle, resection of a fragment of 1st rib, exploratory puncture. Pneumotomy, opening of a cavity the size of hazel nut, iodoform tamponade.	Recovery. Cavity rapidly obliterated (2 mos.) Injection of Koch's tuberculin after the operation many bacilli in the sputum.	Recovery.	. . . . .
Adhesions.	. . . . .	Parallel with clavicle, puncture. Pneumotomy, opening of a cavity the size of a walnut.	Recovery. Injection of Koch's tuberculin after operation.	No amelioration.	. . . . .
Adhesions.	. . . . .	Parallel with clavicle, puncture. Pneumotomy opening of a cavity the size of a hazel nut, 1 cm. deep.	Recovery. Injection of tuberculin after operation.	No amelioration.	. . . . .
No adhesions.	. . . . .	Resection of 4th rib. Incision of pleura. Partial pneumothorax. Pneumotomy injection of tuberculin.	Death 7th week. Cavity opened spontaneously on 11th day through scar.	. . . . .	. . . . .
No adhesions.	. . . . .	Pneumotomy after suture of pleura. Opening of a small cavity. Drainage, incision made in anterior wall of thorax.	Recovery. A large cavity which could not be opened, discharged into the inside cavity 3 weeks later. Patient much improved.	. . . . .	. . . . .
Adhesions.	. . . . .	Pneumotomy drainage.	Recovery.	Marked improvement, drainage maintained until complete closure of cavity.	. . . . .
Pleural adhesions.	. . . . .	Anterior ⅓ of 2d and 3d ribs, removed parietal layer of pleura opened, apex of lung pulled out after transfixed with needle, tied with strong silk and removed.	Pneumothorax developed suddenly but gave no trouble.	Wound was healed by end of 3d week.	. . . . .
Pleural adhesions.	. . . . .	Level of 2d intercostal space. Pneumotomy, opening of a cavity located 2 cm. deep. Hemorrhage at the moment of incision, drainage, injection of chlorin gas next day.	Death on 8th day from hemorrhage.	. . . . .	No necropsy.
Adhesions.	. . . . .	Incision in 3d interspace. Pneumotomy, opening of a cavity, drainage. Injection of chlorin gas.	Death 24th day, cachexia.	. . . . .	No necropsy.
. . . . .	. . . . .	Superficial incision, issue of pus, of gangrenous debris and gas. Iodin injected into the wound appeared in the sputum.	Recovery.	. . . . .	. . . . .
Pleural adhesions.	Positive puncture, bloody fluid.	3 inches of 8th and 9th ribs removed in axillary line underlying cavity freely opened, ½ pint bloody purulent fluid, caseous material evacuated, irrigations with boric and sal. skin incision partly closed, double drainage tube, tube taken out after several days. Incision healed.	Immediate improvement.	Was soon up and about house. Area of dulness diminished. Respiratory sounds heard at a lower level than before.	. . . . .
. . . . .	. . . . .	Incision and drainage.	Recovery.	. . . . .	. . . . .
. . . . .	Puncture and dilatation of tract, drainage of ½ liter pus.	. . . . .	Recovery.	Condition satisfactory 6½ mos. later, tuberculosis still exists.	. . . . .
. . . . .	. . . . .	Pneumectomy, resection of the 3d rib.	Death occurring the night following the operation.	. . . . .	. . . . .
. . . . .	. . . . .	Resection of 10 cm. of 7th and 8th ribs, exploratory pneumotomy, upon opening a series of dilated bronchi were found.	Death in one month.	. . . . .	Tuber. right apex without caviti's, small cavity at base not opened.
. . . . .	. . . . .	Resection of 7.8 cm. of 8th and 9th ribs. Pneumotomy, incision 4 to 5 cm. in depth without opening cavity.	Temporary amelioration.	Death 3 months later.	Disseminated tuberculosis in entire right lung.
Pleural adhesions.	. . . . .	Thorocoplasty, 5th, 6th, 7th, 8th and 9th ribs resected. Pneumotomy.	Recovery.	Much improved 3 months later.	. . . . .
. . . . .	. . . . .	Incision in 2d interspace and ant. axilla pleural pneumo chorax by attaching parietal to viscera pleura. Piece of lung 2 cm. in all directions was excised, wound closed without drainage.	Patient up 9th day.	4 yrs. after operation patient was healthy.	. . . . .
No adhesions.	. . . . .	Incision and application of a paste of chlorid of zinc in the first intercostal space. Pneumotomy after exploratory puncture, resection of 2d rib 16 days later, many small cavities opened.	Recovery.	Death 3 yrs. later from progress of the tuberculosis.	. . . . .
Adhesions.	. . . . .	Thorocoplasty, resection of 2d and 3d rlbs without opening.	Recovery.	See foot note.	Cicatrized cavity right apex, sclerotic lung cavity open'd during 2d operation is recent. Sclerosis of left apex. Enorm's sternocostal cold abscess, communicating with the cavity opened by a narrow orifice. Right lung almost completely destroyed. left lung studded with tubercles.
. . . . .	. . . . .	Incision and resection of 6th rib in axillary line. Puncture, discharge of pus containing bacilli, lavage, drainage.	Death 1 month later.	. . . . .	
Adhesions present.	Puncture at lower dull area, negative, a 2d puncture at higher and deeper point revealed pus.	Pneumotomy, U-shaped incision 3½ inches between 7th and 8th ribs and anterior axillary and scapula lines resected, pleura opened. Pleural cavity shut off with gauze, lung incised with cautery to depth of 1 and 1¼ inches, 75 cubic cm. of thick non-fetid pus escaped, opening enlarged and cavity swabbed and packed with gauze. Gauze removed from pleural cavity skin and muscle flap sutured.	Improvement, temperature lowered.	. . . . .	. . . . .

Cure maintained 1 year. Closure of cavity, relapse and reappearance of the signs of cavity in right apex. 2d operation, resection of 2d, 3d, 4th and 5th ribs. Pneumotomy, dressing compression. Death 28 days later from emphysema and accidents produced by the chloroform.

through which to work. After the chest has been opened the lung is to be drawn out, transfixed, ligated and amputated with the cautery. The cavity should then be drained and only partially closed. Tuffier in his operation deviated from this by producing an extra-pleural pneumothorax before opening the parietal pleura; he then divided the pleura and drew the diseased portion out through the opening. He closed the wound completely; his patient was about in twelve days. He places particular stress upon the advantage of preliminary extra-pleural pneumothorax. The pathologic conditions which render this operation necessary are such that at a time most favorable for the performance of the operation the patients will not submit, and when they desire the operation the pathologic changes are so far advanced that they are not in condition to withstand its severity. In one attempt at this operation adhesions were found so firm and resisting that the operation had to be abandoned. The dangers of separating an adherent apex on the mediastinal side should be borne in mind; 1, the mediastinal septum in front is thin and easily lacerated; 2, there is danger of tearing the azygos veins and the subclavian artery or vein at the extreme apex; 3, lower down there is danger of tearing the right cardiac auricle; this accident happened to me in an operation on the cadaver. When the lung is in an advanced stage of tuberculosis its infiltration is so extensive that it is not compressible, and estimates on its removal must be based on the principles governing removal of a solid tumor of equal size. I have found when placing the forceps or ligature on the lungs of cadavers in this condition, that many times the tissue lacerated with the pressure. It must therefore be understood that the ligature must be placed on the base of the lobe, including only the arteries, veins and bronchi, and that the opening must be sufficiently large to admit of the extraction of a solid mass the size of the lobe to be removed. The removal of a complete lung for tuberculosis has not to my knowledge been attempted. In advanced tuberculosis the pathologic changes produce insurmountable barriers against the operation of pneumectomy, and while occasional success in partial resection may be achieved it can never become a practical method for the treatment of tuberculosis. I believe the trend of surgery in tuberculosis of the lung will be the utilization of surgical means for placing the lung in better condition for repair, as quiesence, compression, drainage, etc., rather than extirpation of the tubercular focus.

Hydatid cysts.—The surgery of hydatid disease of the lung is well established and exact lines are drawn as to its operative treatment. The results have been very flattering to the surgeon. It is variously estimated that from 11 to 16 per cent. of hydatids of the body occur either in the pleura or in the lung, these situations being the most frequent next to the liver. Many of the cases are secondary to disease of the liver, as the following case illustrates:

J. L., male, aged 46, came under my observation November, 1884. Six weeks previous he complained of a sudden pain in the right side, followed by dyspnea and a dry hacking cough; the distress was severe for three days; a diagnosis of pleurisy had been made and he was placed under medical treatment; when he presented himself at my office the following conditions were found: Respirations 36, temperature 99.2 degrees, pulse 110; he complained of great compression in the right side; dulness extended to the spine of the scapula behind and to the second interspace in front; respiratory sounds were absent; there was a bulging of the intercostal spaces and the apex beat was displaced one inch to the left; the liver margin extended one and one-half inches below the costal arch. The edge of the liver was soft and pliable and of regular anatomic formation.

Diagnosis.—Hydrothorax; aspiration of a large quantity of clear fluid; microscopic examination revealed hooklets. Patient had temporary relief, but in three weeks the distress was as great as before, when an operation was advised.

Operation.—Resection of two inches of the ninth rib in the anterior axillary line; a large quantity of fluid escaped; an opening in the diaphragm could be felt about two and one-half inches from the costal margin. A perforated drain was inserted through this opening and brought out through the chest wall. The patient improved rapidly in his general condition. Four weeks later there was a free discharge of bile through the tube. The pleural cavity rapidly contracted and at the end of three months there was nothing but a sinus into the liver, which was discharging bile freely; the tube was removed in five months; bile continued to discharge in enormous quantities; the sinus closed nine months from the time of the operation; the patient has remained well up to the present time.

In the United States hydatid is infrequent; it is often met with in the Canadian provinces and particularly among the Finlanders (A. H. Ferguson). The mortality from the disease treated medicinally or without treatment has been variously estimated; Niesser places it at 58.7 per cent; Devaine, 66⅔ per cent.; Thomas, 54 per cent. The great majority of cases that recovered without surgical aid ruptured into the bronchi, and a few externally.

There are three methods of external treatment: 1, puncture; 2, free incision; 3, removal. Maydl collected sixteen cases treated by puncture, of which 69 per cent. died. The dangers of puncture are: 1, drowning during operation by opening into bronchus; 2, emphysema; 3, dyspnea from pneumo- and hydrothorax; 4, albuminous edema of the lung. The fatal accidents of puncture of hydatids must be borne in mind, and in hydrothorax when hydatid is even suspected exploratory puncture must not be performed; as an incision has no more dangers than puncture in simple hydrothorax and is so very much less dangerous in hydatid cyst, it should be adopted in place of puncture in doubtful cases. Puncture with canula is curative in only 25 per cent. (Tuffier); as the canula becomes occluded the multiple cysts are not drained, infection takes place and the incision will eventually have to be resorted to. Tuffier gives the immediate mortality of puncture with canula as 50 per cent. Thomas, 1885, gives the following comparison of results: Hydatids of the lung and pleura not interfered with had a mortality of 54 per cent.; treated by puncture, 27 per cent.; treated by incision and resection, 16 per cent. Schwalbe (l. c.) states that hydatids of the lung without operation have a mortality of 60 per cent. Lopez collected thirty-six cases treated by pneumotomy; the mortality was 14 per cent.

Suppurating hydatids communicating with the bronchus, if not progressing favorably, should be treated as pulmonary abscesses, opened and drained, after fixation of the lung to the thoracic wall. Roswell Park collected thirty-two cases with four deaths, a mortality of 12.5 per cent. It is claimed by Tuffier that 90 per cent. of the cases recover after pneumotomy.

Tumors, from 1884 to 1896.

Case 1, 1884. Kronlein Berliner Clin. Chir. Woch., 1884, p. 199, and 1885, p. 185, Correspblatt Schweitzer Aerzte 1887, xvii, p. 686, et in Mueller Deutsche Zeith. für Chirurg., 1888, Vol. 67, p. 41. Female, 18 years. Diagnosis: sarcoma of lung secondary to costal sarcoma of eight months' standing, in sixth rib, left axillary line. Operation in thorax pleura: incision from second to fifth rib, resection of thoracic wall, fifth, sixth, seventh and eighth ribs being found adherent to tumor; once adhesions are separated there is produced an alarming thorax; anesthetic had to be stopped. Operation on lung extirpatory of secondary sarcomatous nodule the size of a walnut; resection done in healthy pulmonary tissue, lung sutured with catgut, drainage of pleural cavity; recovery without incidents. Results: recurrence without scar three years and three months

ter extirpation and pneumectomy, recurrence six months after in thoracic wall, new operation but no pneumectomy; died seven years after st operation: general metastasis.
Case 2, 1887. Sedelot, quot. Baldus in 1887, Bown, p. 16, et Par. Mayer-ang, dissertatio, 1889, p. 13. Diagnosis: sarcoma of lung secondary to rcoma of thoracic wall. Operation in thorax pleura: resection of two bs and all of thoracic wall, including pleura. Operation on lung: resection of portion of lung adherent to thoracic wall. Recovery.
Case 3, 1895. Mueller, Deutsche Zeitsch. für Chirurg., 1895, Vol. 37, p. 42, ale. Diagnosis: chondromo of lung secondary to costal osteo-sarcoma. ur years; base of right lung and anterior portion of thorax from sixth seventh ribs and from sternum to axillary line. Operation in thorax eura: resection of thoracic wall from third to sixth ribs, inclusive, llesions of lung to pleura being separated there is produced a complete neumothorax with cessation of respiration; these symptoms ceased on ng being drawn to thoracic wound. Operation on lung: extirpation of eoplastic nodule, double ligature of pulmonary pedicle and suture of ng wound, which measures 9 by 13 cm.; drainage of pleural cavity. apid recovery in three weeks; superficial recurrence in scar two years nd three months after extirpation; patient is still cured, four years and ight months after first operation.
Case 4, 1894. Weinlechner in Mueller Deutsche Chirghief., xl, 2, p. 269, Mueller Deutsche Zeitsch. Chirurg., 1895, xlvii, p. 41. Diagnosis: yxocongroma of lung second to myxocongroma of thoracic wall. Operation in thorax pleura: resection of three ribs and of all thoracic walls, ncluding pleura, resection of portion of lung as large as the palm of the and adherent to tumor, resection of two pulmonary metastatic nodules in nferior lobe. Death twenty-four hours after. Necropsy: purulent pleurisy, excision of thoracic walls had not allowed union of soft parts.
Case 5, 1896. Koenig, Berlin Woch., 1896, p. 132. Diagnosis: sarcomatous nodule secondary to sarcoma of sternum. Operation on thorax leura: resection of sternum. Operation on lung: resection of small arcomatous nodule without suturing pulmonary wound. Died on night ollowing operation of a pneumothorax.
Case 6, 1896. Williams, quot. by Zegari, p. 143. Male, 37 years. Diagnosis: myxocondroma of median lobe of right lung, secondary tube costal yxocondroma; duration four years; from second to seventh ribs in eighborhood of nipple. Operation in thorax pleura: resection of thorax of third, fourth and fifth ribs, pneumothorax, collapse of lung. Operation on lung: resection of a voluminous nodule of small volume in superior lobe; death due to collapse.

Actinomycosis of the lung.—Actinomycosis of the respiratory organs is next in frequency to actinomycosis of the digestive tract. It may appear as a primary lesion of the lung, or the lung may be secondarily attacked from an actinomycosis of the bony framework of the chest or from an actinomycosis penetrating the diaphragm. A detail of the history of the disease, while it might be very interesting, will not be considered here. Langenbeck in 1845 first described the disease. Ponfick, Israel and Bollinger made a very extensive study of the subject. Israel collected nine cases of actinomycosis of the air passages. When it occurs primarily in the lung it may have been inhaled. When the lung is infected the tendency is to a rapid infiltration and extension of the disease. It is not so likely to be overlooked now as in former years; the sputum of every patient with chronic pulmonary lesions is repeatedly examined, and while the ray fungi are not sought, they are not often overlooked. The medical treatment of actinomycosis is becoming more satisfactory as time advances; iodid of potassium has proved most useful. We find in the literature a number of cases in which it was used with curative effect; it should be administered in increasing doses until iodism is produced. This is now being supplemented by the internal use and external application of nitrate of silver, suggested by Dr. Poore (Paget). He bases his recommendation on his experience in one case of actinomycosis of the right pleura and the specific fatal effect of nitrate of silver upon the aspergillus niger noted by Raullins; one part in a million and a half in culture media would prohibit the growth of the latter. When the lung is infected with actinomycosis it produces no specific symptoms in its early stage; later the chest wall is attacked and external sinuses may develop, when the true character of the lung lesion can be readily recognized if it has not already been detected in the sputum. If treated surgically the indication is a radical extirpation of the disease; if this can not be accomplished, careful and thorough curettement and packing with a nitrate of silver gauze is indicated. Godlee favors radical surgical treatment when iodid of potassium has failed, and while I agree with him in this *dernier ressort*, from my experience with surgical treatment of actinomycosis in other parts of the body, I would consider that the lung is a very unpromising field for surgical treatment. A very interesting case was reported by Dr. Karewski at the recent meeting of the Berlin Medical Society.[78] Fraenkel made the diagnosis from the physical appearance without the aid of the microscope; extensive resection of the ribs and chest wall was made; the patient recovered and only a small sinus remained.

Dermoid cysts will not be considered in this article, as they are always mediastinal tumors and not true tumors of the lung, although they frequently rupture into the trachea or bronchi and their contents are expectorated (see Clotta's case, also a very interesting case reported by Dr. Ogle;[79] another by Rickman J. Godlee).[80] These tumors are all of mediastinal origin (Bland Sutton).

Neoplasms of the chest wall and lung requiring pneumectomy.—Of the neoplasms occurring primarily in the chest wall and involving secondarily the pleura and lung we may mention, 1, the sarcomata of the ribs and sternum; 2, the enchondromata (varieties); 3, the carcinomata, occurring first in the mammary gland and involving the muscle, bone and pleura of the chest wall by continuity of the process or by secondary glandular infection. The following tumors in the lungs are pathologic curiosities: Fibromata, lipomata, angiomata, dermoids (Clotta) and gummata of the chest wall. When these neoplasms invade the pleura, adhesions are not infrequently formed; the lung may also be involved at the time of operation, necessitating excision of a greater or lesser portion of it with the tumor. Primary malignant neoplasms of the lung are rare; secondary involvement of the lung by carcinoma and sarcoma is not uncommon. Wilson Fox, who collected 112 cases of tumors, showed that the disease was primary in 38, secondary in 64 and indetermined in 10. Primary cancerous growths usually originate in the mucous glands, and as these are lined with cylinder cells they are frequently cylindrical epithelioma. An alveolus may be the initial seat of the disease. Primary sarcoma may occur in the lung and is usually of the round-celled variety; spindle-celled and myeloid growths have been observed; they very closely resemble aneurysm and the greatest care must be exercised in making a differential diagnosis. In many cases it is difficult to say whether the malignant disease is primary or secondary in the lung; the surgeon is rarely called upon to operate on these cases, as they are not diagnosed. The class of malignant disorders of the lung which comes to the surgeon for operation is that in which the disease is secondary to disease of the chest wall. This leads us to the consideration of the subject of pneumectomy in general.

Pneumectomy was performed first for the cure of hernia of the lung; one case was published by Rolandus, 1492. The cases of amputation of a protruding lung do not clinically come under the heading of pneumectomy, as they do not involve the dangers and difficulties of technique associated with intra-thoracic pneumectomy. The first pneumectomy was made by Péan in 1861; he was resecting a tumor involving the third, fourth and fifth ribs; the pleural cavity was opened, the ribs mentioned excised and the lung was

[78] Allgem. Med. Centr. Zeit., Vol xxiii, xxiv, p. 298.
[79] Medical Week, Paris, March 5, 1897, p. 101.
[80] Ibid.

found adherent and involved in the tumor. The visceral and parietal pleuræ were sutured and the Paquelin cautery was used to remove the diseased portion of the lung. The first scientific experimental investigation was made by Gluck, 1881 (l. c.). He performed pneumectomy on 6 dogs and 14 rabbits; two of the latter lived for three months; all of the dogs died; in one, in which he ligated the stump of the lung without a pneumectomy, he found that the portion of the lung on the distal side of the ligature did not mummify, but lived. There was primary union of the vessels. There was always immediate cyanosis after the operation. He arrived at the following conclusions: Ligature with pneumectomy is tolerated well by rabbits; if the operation be aseptically and well performed recovery is permanent; primary adhesion of vessels takes place; no cardiac thrombosis; the stump lives and forms part of the cicatrix; the fatality is caused by pneumothorax, pericarditis, infective pleurisy of the same and opposite sides. Milton Antony[81] of Augusta, Ga., reports that in 1821 he was called to a patient in the western frontier suffering from a growth of the lung pressing out the fifth and sixth ribs. He made a resection of these, scooped out the degenerated tissue or tumor of the lung and plugged the cavity; the patient recovered. While this case antedates Péan's it should not be considered a pneumectomy. From his report there is some doubt that any lung tissue was removed, as the patient had no cough nor expectoration and there was no mention made of air escaping through the wound. Be that as it may, he deserves credit for having suggested and practiced sub-periosteal resection of the rib to allow the wall of the chest to fall in and fill the space; an operation which subsequently added much to the fame of Estlander and Schéde. Marcus, in 1881, removed one entire lung from two dogs and three rabbits. One dog died from the anesthetic, the other from purulent pleurisy; the rabbits died on the third, sixth and twenty-seventh days respectively. These experiments were rapidly followed by those of Hans Schmid,[82] which were made independent of a knowledge of Gluck's. He used morphin and ether for narcosis; hemostasis of the excised portion was secured by transfixion and ligation with catgut; he made exact suture of the edges. In eight partial resections in dogs there were five deaths and three recoveries; the deaths were caused in four by suppurative pleuritis, in one by carbolic acid poisoning. In partial resections a V-shaped incision was made with accurate suture of edge. He removed both apices successfully in the same dog, six weeks intervening between the operations; there was no secondary hemorrhage; he expressed the belief that partial excision was applicable to local tuberculosis, injuries, abscesses and tumors of the lung and rib.

In May, 1881, Bloch performed nine experiments for the removal of the lung on five rabbits and four dogs; all of the former died immediately after the operation; one of the latter lived fourteen days; the other dogs all died shortly after the operation. In July, 1881, he performed sixteen experiments with resection of the rib on rabbits; all died a few days after from hemorrhagic pleurisy; the time required for operation was forty-five minutes. He changed his method to an intercostal incision with the removal of single lobes and reduced his time to ten minutes. With this method two dogs recovered, one from a lower and the other from a middle lobe amputation, when the dogs were killed no pneumothorax, exudate nor displacement of organs was found. He noted the anatomic communications of both pleural cavities in some dogs; all with this communication terminated fatally; he advised against drainage. He removed infiltrated lobes through intercostal spaces and favored that plan very much.[83] Bloch's experiments were very discouraging, but the profession was soon relieved from their depressing effect by the more extensive, scientific and fruitful researches of Biondi which carried the profession too far in the opposite direction. In 1882 Biondi made the following experiments: Extirpation of right lung, healthy animals, 2 experiments, 12 recoveries; extirpation of left lung, healthy animals, 34, 18 recoveries; extirpation of both apices, 3 experiments, 3 recoveries; middle lobe, 1, 1 recovery.[84] His experiments were exact as to details and his results were the best obtained. He found that the great majority of animals infected artificially with tuberculosis in the lung and not treated died of the tuberculosis; on the other hand, he found that a timely resection of the apex of the lung saved a goodly number. The success of these experiments stimulated surgeons to operations for removal of the lung. Zakharwitch made a minute study of the technique of these operations experimentally on cadavers and on animals. His results almost equalled those of Biondi. He laid down definite rules for pneumectomy. W. LeMoyne Wills[85] reports some very interesting and instructive experiments of pneumotomy and pneumectomy.

Weinlechner, in 1882, removed three ribs for malignant disease and excised two nodules from the lung; the opening in the pleura was so large that he found it impossible to obtain a sufficient flap to cover it; closed with packing; patient died in twenty-four hours from acute pleuritis.

Kroenlein, in 1884, operated on two cases; one ended fatally a few hours after operation and the other lived but a few days. Ruggi, in 1885, performed two operations; in one he succeeded in removing the apex, and the patient died on the ninth day from carbolic acid poisoning; in the other he found it impossible to detach the lung from the pleura; the patient died thirty-six hours after the attempt.

Sedillot, in 1887, removed a portion of a lung which was adherent to and involved in a sarcoma of the chest wall. Patient recovered. W. Miller, 1888, removed a portion of lung and chest wall successfully for enchondroma.

In 1891 Tuffier removed successfully a tubercular nodule from the apex of the right lung. He first separated the parietal pleura from the ribs all around the field of operation; when this was accomplished he palpated the tumor, divided the pleura, grasped the lung with the forceps and drew it out through the slit in the pleura, producing a hernia of the lung. A tubercular nodule the size of a hazel-nut was excised and the lung was allowed to drop back. The incision was completely closed; the patient was reported well four years later. This was certainly an ideal case for excision.

D. Lowson, 1893, excised the apex of the right lung for tuberculosis. He made an angular incision and resected the second and third ribs. A small opening

[81] Phil. Med. Jour. 1823, p. 108.
[82] Berlin. Med. Woch., No. 57, Dec., 1881.
[83] Deutsch. Med. Woch., Berlin, 1881, vii, p. 684.
[84] Gior. Internaz. d. So. Med., Napoli, 1882, N. S. iv, 759-1883; N. S.
[85] Southern Calif. Prac., Los Angeles, 1892, vii, 167.

was made in the pleura; he filled the pleural cavity with sterilized air to force collapse of the lung. This caused no dyspnea or cyanosis; he then opened the pleura, freed the adhesions and brought the lung out through the fissure, transfixed it, ligated and exsected the infiltrated portion; he replaced the lung and closed the chest cavity without drain. It had to be opened two weeks later for the removal of some pus and blood; the patient was discharged from the hospital in eighty days; she had gained rapidly in flesh and the wall was closed to a small sinus. This operation shows the most praiseworthy preparation and execution, and the result was well deserved.

These operations were rapidly followed by those of Miller, Kœnig, Mikulicz, Albert, Tillmanns and others; but the hope of success that was born from the results of Biondi's experiments has never been realized. In 1887 Roswell Park, in an able article, reviewed the cases treated up to that time. E. Willys Andrews[86] advocates removal of upper lobe of lung, and has confidence in its success; he emphasizes the dangers and difficulties caused by adhesions; he believes large incision in the axillary line is most advantageous for operation. Pneumectomy for primary tumor of the lung has never been performed. Schlepfer collected 16 cases of enchondroma in which the chest was opened, with 8 recoveries and 8 deaths. Tillmanns considers that the greatest danger in the removal of these tumors is in the opening of the pleura and mediastinum; not from the pneumothorax but from the infection of the pleura. Terrier advises the free opening of the pleura, regardless of the pneumothorax, for the excision of these tumors. For hernia he favors the reduction without rib resection.

My experiments were made to familiarize myself with the technique and feasibility of the various operations; the manipulation and exposure for observation of certain phenomena were excessive and were not conducive to the recovery of the animals. The following is the report on pneumectomy:

Experiment 2.—Oct. 24, 1897: small brown dog; ether anesthesia; the same antiseptic precautions were used as in experiment 1. Osteoplastic resection of fourth and fifth ribs of right side was made; parietal pleura retained on flap; action of mediastinal septum observed as in experiment 1. Lower lobe of right lung was brought out through and plugged the opening; this relieved all respiratory difficulty; the lobe was transfixed, ligated with heavy silk and two-thirds of the lobe excised; there was no hemorrhage and the lung was returned; a subcutaneous buried suture of catgut entirely closed the wound; time consumed in operation, twenty-one minutes. By a mistake in orders the dog received nothing but water for three days; when the error was discovered he was very weak; he died on October 29, five days after the operation.

Postmortem.—Perfect primary healing of external wound had taken place; there was a slight edema of deep tissues; periosteal flap in good position; on opening the pleural cavity the lung was found to be entirely free from adhesions; the pleural cavity contained no pus or serous fluid; the ligature was in position; pressure necrosis had liberated a small portion of the lung on the side nearest the base; there was no odor from the stump; the remaining one-third of the lobe was normal; there was no pneumonic infiltration; thrombosis had not advanced in the ligated arteries or veins; the bronchi were closed; there was no pericarditis or pleuritis on the opposite side; there was no pathologic cause of death and it was probably due to the error in orders mentioned.

Experiment 3.—Oct. 24, 1897; small black dog; ether anesthesia; an osteoplastic flap of second and third ribs on right side was made; movements of mediastinal septum observed as in previous experiments; the septum was thicker than in the last dog; there was marked cyanosis after opening the pleura; when the hilum of the lung was grasped with forceps so as to prevent the vibration of the septum respirations were rapid, but the cyanosis and collapse disappeared; the upper lobe was drawn out through the opening and ligated at the hilum en masse with silk ligature; the wound was closed with catgut as before; time consumed in operation, sixteen minutes. The dog left the operating table in good condition but became quite sick the same evening, and continued so until death forty-eight hours after operation.

Postmortem.—Accumulation of pus present between skin and osteoplastic flap; the latter was held fairly well in position by sutures; the pleural cavity was found full of sero purulent fluid; numerous adhesions had formed between the diaphragm and the parietal wall; the lower lobe was partially consolidated with pneumonia; ligature was buried in exudation; pleuritis on left side; pericardium free from inflammation.

Experiment 4.—Nov. 8, 1897; small black dog, weight about thirty-eight pounds. A U-shaped incision with resection of one and one-half inches of the fourth rib on right side was made; osteoplastic flap; the lung was immediately drawn out and three lobes ligated at hilum with catgut without transfixion. The opening in the chest was closed by a deep catgut suture and a continuous silkworm-gut cutaneous suture; time for operation, twelve minutes; November 9 dog in good condition; November 10 dog in good condition, wound looks well;

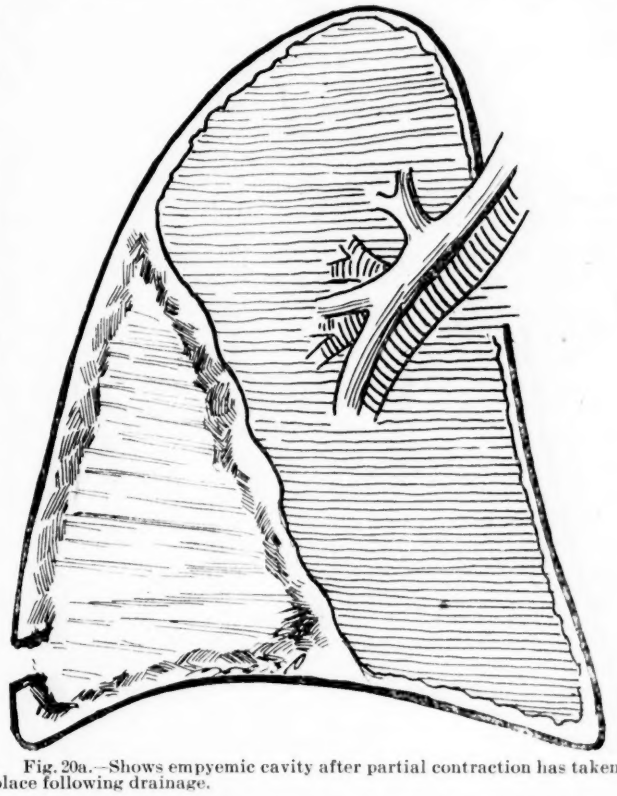


Fig. 20a.—Shows empyemic cavity after partial contraction has taken place following drainage.

November 11 dog playful but breathing rapidly; November 12 dog in excellent condition; the silkworm-gut suture had been bitten out and there was a slight gaping of the flap; air entered and escaped through the skin wound in small quantity; it is believed that this passed in and out of a subcutaneous cavity only and that the pleura was still closed; November 20, dog in good condition, external wound almost closed; no air passing through the opening; the dog became fat and appeared to suffer no discomfort except a slight increase in frequency of respirations; he was killed on March 14, eighteen weeks after the operation.

Postmortem.—A heavy clamp was placed on the trachea to prevent collapse of the lung when the chest was opened; the organs were thus retained in the same position as during life; the external wound had cicatrized and contracted; there was a defect in the bony thoracic wall about one inch in diameter where the rib had been resected; the edges of this defect were covered with shreds of connective tissue. the ends of the rib were smooth and covered with connective tissue. The thyroid gland was much enlarged; the right pleural cavity was small and had in it a few drams of serous fluid; the heart and mediastinal contents were displaced markedly to the right; the delicate mediastinal septum was intact; the pulmonary stump could not be recognized; a mass of connective tissue, firm and glistening, about the size of a hen's egg, occupied its supposed

[86] Chicago Med. Recorder, 1892, p. 537.

location. Shreds of adhesive bands existed between the diaphragm and chest wall; a few vascular villous shreds projected from the pleural surfaces in various places; the left pleura was smooth and non-adherent; pericardium was normal. The esophagus, larynx, thyroid, trachea, heart, entire left lung, the lower lobe of the right, the anterior thoracic wall and the diaphragm were removed en masse and submitted to Dr. W. A. Evans for pathologic examination, report of which is as follows: The right side of the diaphragm was elevated and attached to the mediastinum and the chest wall. A line drawn through the center of the trachea and continued downward passes through the center of the heart, cleaving its tip exactly in the middle. The entire heart had been drawn to the right, but the most marked displacement was in the swinging of the tip with the base fixed. The sternum was bent to the right, as shown in the diagram (Fig. 20 b.) outlines for which were measured. The bend was most marked at the fourth rib. Two cm. to the right of the sternum and 13 cm. above its tip is an opening 4.5 cm. long, by 2 cm. wide. This opening is covered by a flap in which is a piece of rib 2.5 cm. long; this piece is entirely separated from other bony structure. The space between the

Fig. 20.—Deviation curve in sternum, Experiment 4.

ragged ends of the rib and this piece is scant 3 cm.; all of the surfaces of these pieces show slight nodular periosteal thickening. The soft tissue flap which contains this piece of bone bellows out into a hernial sac, measuring approximately 5 cm. across and 4 cm. in height. Its internal surface is smooth and glistening except for bands of yellow-colored fibrous tissue which run here and there; these blend into the connective tissue of the wall.

Left lung: The lowest lobe is large, fully expanded and has no adhesions to the wall; the middle lobe also no adhesions to the wall; these two lobes are bound together by firm adhesions. Upper lobe; this measures 6x4½x4 cm., is heart shaped, and is covered by firm, thick pleura .8 to .5 cm. in thickness. The pleura has a smooth glistening surface. There are no pleuritic adhesions. The bands of fibrous tissue in this lung run parallel to its surface. The outer layers of the pleura are the densest. The upper lobe of the lung is not attached to the others. The appearance of this lobe is that of a cyst. The bronchial tubes are patulous to the smallest. The lung substance is firmly compressed.

Right lung: *The upper lobes* of this lung are gone. A stump containing a small amount of lung is to be seen. (See Figs. 21 and 22). This was excised for microscopic examination. The lower lobe has attachments to the diaphragm which are hard and ligamentous. Its attachments to the pericardium and to the mediastinum are equally as firm. The pleura measures .3 to .5 cm. in thickness, and is firm and dense on its outer surface; is free except at the attachments noted. On incision the lung substance is firmly compressed and the bronchioles are patulous.

Microscopic examination of the stump of the upper lobe shows the following: The end of the bronchus is plugged with fibrous tissue, the bands of which run in every direction. In this mass of tissue are a few bronchial glands. Besides this there is no trace of epithelium. The connective tissue has grown from the mucosa and the inner fibrous coat. The islands of cartilage run in every direction, but the general disposition is to form a triangle. The cartilage plates do not show degeneration phenomena. The vessel wall interior to the inner elastic lamina is thicker than the balance of the wall. The fibers of the wall all run in the same direction. The blood vessels are closed by growths of connective tissue which are mostly inside of the inner elastic lamina. Sections from higher up in the bronchial tree show a small lumen with the mucosa thrown into the usual folds. The epithelium is falling away and much of it is loose in the lumen.

This detailed report is submitted to show the histology of the closure of the vessels and bronchus of the stump; it will be noted that this dog had three lobes in his left lung, and

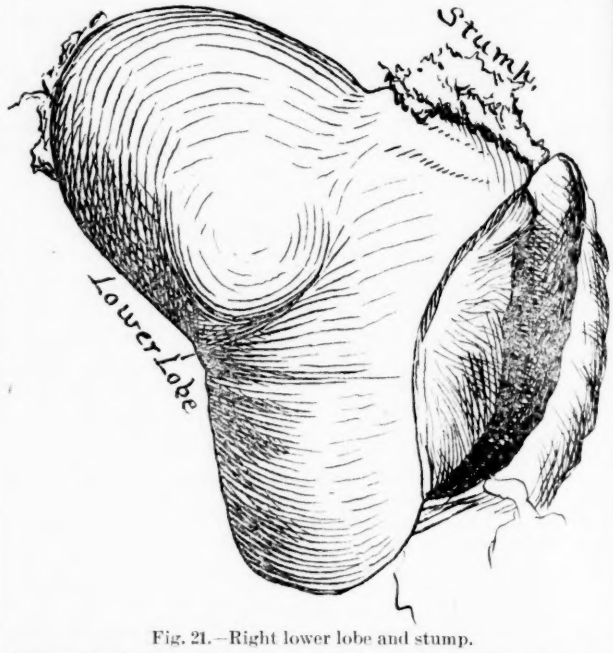


Fig. 21.—Right lower lobe and stump.

while we had removed three on the right side there was still another left, showing an anomaly of development. Quénu observed that the dog's lung is occasionally divided into as many as six distinct lobes by fissures extending to the hilum.

Experiment 5.—Nov. 8, 1897; large black and white dog; thorax opened on right side, as in previous operations; the mediastinum ruptured and the dog ceased to breathe; after the lungs had collapsed the chest was compressed and the aperture closed with the hand; then the dog began to breathe but with considerable difficulty; on account of rupture of the mediastinum no further attempt was made at operation; the chest was compressed and the muscular flap rapidly closed over the opening with a firm catgut suture and buried catgut subcutaneous suture. November 9, dog in fair condition; November 10, dog sick, breathing rapidly; November 11, dog died.

Postmortem—incision in chest wall adhered per primum; right lung was collapsed; left lung was dilated apparently to normal size; it was slightly emphysematous; there were a number of hemorrhagic patches in the lower lobe; no evidence of hemorrhage or suppuration; cause of death could not be ascertained, but I believe it was due to the rupture of the mediastinum, which impaired his respiration after the closure of the chest.

Experiment 6.—Nov. 25, 1887; large white bull dog; there was the usual preparation and anesthetic; incision was made the same as in previous experiments; the entire right lung

was drawn out through the opening; there was considerable pressure on the hilum to produce this result; a catgut ligature was thrown completely around the hilum; the lung was excised and the stump sutured with catgut in the opening close to the sternal border; there was considerable tension on the stump; time of operation, twenty-minutes. I had hoped by this method to produce an extra-pleural treatment of the stump, but in the dog I could not use the hysterectomy retention needles to hold the stump extra-thoracic; the external wound was closed with buried catgut suture; November 26, dog was very sick; on the morning of the 27th he was found dead.

Postmortem—Incision firmly agglutinated; the stump of lung was found partially adherent in the incision; there was some blood in the pleural cavity, and a septic pleuritis on both sides; the catgut ligature on the stump had given way.

The difficulty encountered in this case in drawing the stump of the lung forward for extra-pleural treatment should not be experienced in the human, as the longest diameter in the dog is the antero-posterior, while in the human it is the shortest.

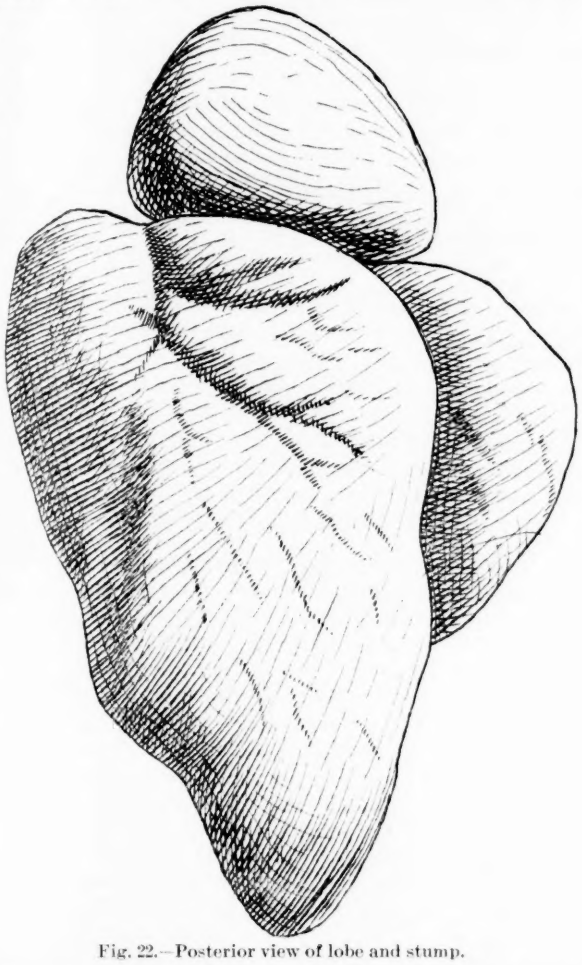


Fig. 22.—Posterior view of lobe and stump.

In the cadaver I found it easy to draw the lung out through an opening on the side of the sternum, and believe that in pneumectomy the stump can be treated in this position; it appears from the results in pneumectomy for pulmonary hernia that this treatment of the stump will be the most favorable.

Experiment 7.—Nov. 25, 1897; small black dog; resection of third rib, right side; osteoplastic flap was made; ligation of the hilum of the entire lung above the bifurcation of the large bronchus; stump top sewed. I endeavored to secure a pleuritic flap from the mediastinum and chest wall to cover the stump, but did not succeed; the chest was closed as in previous cases; an aspirating needle was then inserted into the right side and the air in the chest cavity pumped out for the purpose of drawing the mediastinal septum to the side operated, and assisting the expansion of the left lung; this improved the dog's respiration materially; time consumed in operation, thirty minutes; the dog when removed from the table was in poor condition; November 26, dog improving; November 27, in fair condition; November 28, not so well; drowsy; November 29, very sick; November 30, dog died.

Postmortem.—Incision healed per primum; when the pleural cavity was opened air entered with considerable force; there was no bad odor; point of ligation presented a hard nodule of granulation tissue which seemed to be aseptic; the bronchus was closed; left pleural cavity normal; pericardium normal; examination of specimen showed closure of artery and vein with small clot near point of ligature; mucous surface of bronchus granulating: cartilage unchanged; cause of death not ascertained.

Experiment 8.—March 26, 1898; large female dog; an osteoplastic flap of second and third ribs was made; two upper lobes of right lung were ligated at base with chromicized catgut and excised; the stump was covered by suturing the base of the lower lobe over with chromicized catgut to form a cap; this left no abraded surface within the pleura; the dog died on the third day.

Postmortem was made fifteen hours after death; external wound found clean; there was emphysema of chest wall in neighborhood of wound with slight discharge of sero-sanguinous fluid through deep line of sutures; right pleural cavity contained about 500 c.c. of fluid blood with few coagula which were adherent to the stump; the stump was found in good condition, the lower lobe covering about two-thirds of it; the ligatures were in position; the entire parietal and the remaining portion of the visceral pleuræ were covered with a thick, hemorrhagic membrane; when this was peeled off the underlying pleura was injected but smooth and glossy; heart normal; pericardium and pleura of opposite side normal. Cause of death, septic pleuritis.

Experiment 9.—April 24; large female dog, 45 pounds; ether anesthesia; an osteoplastic flap of four inches of fifth rib (right) was elevated. This rib I find is the best to resect in dogs, as it permits easy access to the hilum of the lung; on the admission of air respiration ceased; the thin mediastinal septum flapped to and fro and soon became emphysematous from the admission of air between its layers; for two minutes the respiratory efforts continued and then suddenly subsided; the heart continued its regular action; the right lung collapsed, contracted around its hilum and the diaphragm receded; the entire lung was grasped with the fingers and drawn out through the opening: as soon as it plugged the orifice the dog began a rapid gasping respiratory movement which soon became regular and full; the upper and middle lobes were separated from the lower, ligated at the base with chromicised catgut and excised; with three continuous catgut stitches the base of the remaining lobe was sewed over the stump of the excised lobes, forming a cap or covering; the stump was allowed to recede into the chest; there was no hemorrhage; the mediastinal septum was now very emphysematous and bulged greatly to the left side; the left lung could be seen through the delicate septum; a deep row of catgut sutures approximated the muscle wall and pleura and a superficial buried subdermal catgut suture approximated the skin; I used the buried suture as I found it would materially lessen the danger of superficial wound infection; an aspirating needle was then introduced into the fourth interspace and the air aspirated from the right side; this was for the purpose of re-expanding the lower lobe of the right lung and putting the mediastinal septum on tension so as to aid the respiration of the left lung. April 25, the dog had been very quiet and apparently comfortable; she took her food freely this morning; her respirations were, however, rapid; in the evening her respirations were still more rapid but she partook of food; April 26, dog panting and very sick; died at 9 o'clock A.M.

Postmortem.—There was primary adhesion of skin and muscle; when the chest wall was opened there was neither entrance nor exit of air; thirty-four ounces of fluid, sero sanguinolent, flowed out of the wound; on the left side there was a sero-purulent pleurisy with edema of the lung; the lung was greatly compressed; the mediastinal septum bulged far to the left of the median line; the right pleura was covered with a fibrinous exudate about one-eighth of an inch in thickness; it was divided into many compartments by trabeculæ of this material extending from the mediastinal septum to the chest wall; lower lobe of right lung collapsed and hidden from view by the fibrinous exudate; the stump was completely covered by the adherent lobe; the death was caused by the large accumulation of fluid shutting off her respiration, there had been no hemorrhage.

Experiment 10.—May 1, 1898; large male dog difficult to anesthetize; when finally overcome was very cyanotic; respired feebly; when the chest was opened respiration ceased; artificial respiration resorted to with no effect; the heart ceased to beat; tracheotomy was then performed and a rubber drainage tube inserted into the trachea; the upper air passages were closed; the lung could be easily made to expand and protrude many inches through the opening, illustrating beautifully the

practical application of Tuffier's method of artificial respiration; it was however too late for restoration.

It was my intention before publishing these experiments to produce a number of herniæ of the lung subcutaneously and later amputate the protruding portions, but time did not permit. This should from clinical experience, be the most favorable method of pneumectomy as Coubey collected fourteen cases of hernia treated by pneumectomy, with twelve recoveries.

I wish to express my appreciation and thanks to Drs. W. A. Evans and George W. Johnson for the assistance rendered me in this work.

SELECTION.

Suture of the Patella.—Macdonald (*Medical News* for July 30) describes a method of treatment of the fracture of the patella, for which he claims uniformly good results, shortened convalescence, freedom from the dangers of sepsis, simplicity, continuance of the encysted silver wire suture, maintaining position of the fragments, and bony union possible in all. He describes his method as follows: "After the usual preparations to secure asepsis have been completed, the limb is fully extended, the surgeon draws the lower fragment of the patella as high as possible, enters the point of the scalpel close to the apex of the bone, and carries it directly inward and upward through the ligamentum patellæ into the synovial sac above the ligamentum mucosum. The scalpel is now withdrawn, leaving a puncture of the joint at its dependent part one-half of an inch in length. This puncture is now covered with sterilized absorbent gauze, and by massage and flexion the joint is practically emptied of effusion through the puncture. Should any difficulty be experienced in removing the effusion, always fluid for several hours after the injury, the metal cannula may be introduced to facilitate the flow. After the removal of the fluid, the fragments can usually be brought in apposition. By a little coaxing, bits of membrane or bursa can be removed from between the fragments, and distinct bone crepitus obtained. An assistant now holds the fragments. . . The point of the needle is introduced into the puncture close to the apex of the patella, carried through its tendon laterally, through the aponeurosis at the side into the tendon of the extensor femoris, keeping close to the patella all the time, and is made to present underneath the skin. A touch with the scalpel permits the point of the needle to be reached, and one loop of silk withdrawn. The needle is then removed, and another loop passed in a similar manner on the opposite side. By means of these two loops of silk the silver wire is drawn into position. The relation of the fragments is now re-examined to determine the absence of tissues between them, and that no tilting exists. When properly adjusted they are steadied by an assistant, while the surgeon, by strong traction on the silver wire, using forceps on each end, buries it in the tissues around the patella and twists it close to the apex. The wire is cut short and buried in the wound. If the process has been carefully followed the fragments will be found in absolute approximation, surrounded and supported by this suture or subcutaneous splint." After dressing the limb in plaster of Paris, "the patient is kept in bed with the foot elevated, for a week, and carefully watched for any reaction. Afterward he is allowed to sit up, and after two weeks go about on crutches. The dressing is removed at the end of six weeks, and a molded posterior splint adjusted. At the end of twelve weeks all dressings are removed and full use of the limb allowed."

PRACTICAL NOTES.

Gangrenous Phlegmons are arrested at once and cured with injections of antidiphtheria serum, according to the experience of Dr. E. Monti in thirty-one cases at Pavia. His previous mortality had been from 45 to 80 per cent.—*Semaine Méd.*, July 6.

Sero-diagnosis of Tuberculous Effusions.—Courmont has found that the serous fluid from local tuberculous lesions has a pronounced bactericidal and agglutinating power (17 out of 18 cases), while the fluid from non-tuberculous lesions of the kind has none (6 cases).—*Presse Méd.*, June 11.

Calcium Carbid in Carcinoma.—In the *Kansas Medical Journal* of July 9, Leslie reports two cases of carcinoma of the cervix with calcium carbid (*vide* JOURNAL, July 9, 1898, pp. 63-68), and one case of carcinoma of both cervix and vagina with calcium carbid and Coley's mixture.

To Disinfect the Stools in Contagious Diseases the following mixture is very highly recommended: zinc sulphate, 100 grams; sulphuric acid, 5 to 10 grams; nitrobenzol, 2 centigrams and 15 centigrams indigo. Five grams in a vessel before using will prevent any odor and putrefaction for twenty-four hours.—*Progrès Méd.*, June 25.

Early Diagnosis of Pregnancy.—G. Reusner supplements Noble's two signs (contrast between the enlarged uterus and small neck and sensation of partial fluctuation) by calling attention to the characteristic pulsation of the lateral uterine arteries in the posterior vaginal vault. The pulsation is so strong and distinct with commencing pregnancy that he establishes his diagnosis upon it as early as the fourth week. It resembles the pulse near inflammatory processes.—*St. Petersburg Med. Woch.*, June 25.

Nervous Pseudo-Appendicitis proceeds from the ovary or neuralgia of the twelfth intercostal nerve, in hysterics with exaggerated reactions. The anterior perforating point of this nerve simulates McBurney's point, but the two other points, vertebral and lateral, confirm the hysteric stigmata. It is curable by therapeutic suggestion. A case is described in the *Presse Med.*, of June 4; a young man who was laparotomized twice and a macroscopically sound appendix removed, returned with the same syndrome of appendicitis for the third time.

Modern Treatment of Burns. Absorbent Compresses.—The *Semaine Méd.* of June 15, calls attention to the following simple and effective treatment of burns, employed by C. Calliano of Turin, with which he has been very successful and which corresponds to the latest theories in regard to burns and intoxications. The part is first cleansed with cold sterile water or a weak antiseptic, using vinegar water for a burn from lime and slightly soapy water in case of corrosion from a mineral acid, after which cold compresses are applied, renewing or moistening with fresh cold water every fifteen minutes. These cold applications relieve the pain at once and abolish it completely in twelve to fifteen hours, after which a compress of sterile gauze or clean cloth is dipped in boricated water at 40 degrees C. and wrung out until only slightly moist but still hot and absorbent, and applied to the burn with an air-tight covering. If there is suppuration this hot compress should be renewed twice a day, cleansing the parts with a stream of boricated water under gentle pressure. If the skin is very red and painful he applies the salve: lead carbonate and lead oxid *aa* 2 grams in 15 grams vaselin; or this liniment: limewater, 100 grams; linseed oil, 50 grams, and thymol, 1 gram. As suppuration diminishes, smaller and lighter compresses are applied. The patient must remain in bed during the entire time of treatment to avoid pressure on the wound, and the part must be raised if possible to favor the reflux of venus blood. Simple diuretics and saline purgatives should be given to promote the elimination of the toxins. If there are evidences of auto-intoxication, inject a tenth of a milligram of atropin or a centigram of extract of belladonna, watching the pupils; or else some simple tonic. The urine should be watched, and if the albuminuria increases, showing progressing auto-intoxication, injections of physiologic salt solution are required.

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SATURDAY, AUGUST 13, 1898.

HEMOGLOBIN ESTIMATION AND ITS PROGNOSTIC VALUE.

The amount of hemoglobin, estimated upon a percentage basis, is the true index to the richness of the blood. Other ingredients, notably albumin, may aid somewhat; but while the latter may be increased in the blood of fairly healthy subjects with considerable rapidity, hemoglobin increase is comparatively slow, and for that reason is a better indicator, regardless of the time of examination. Another point: we can, as a clinical test, quickly determine hemoglobin percentage, while with the remaining blood ingredients a well-equipped laboratory becomes a necessity for such work. The count of the number of red corpuscles, aside from the specific diseases of the blood itself, can not be regarded as of such value as formerly; for instance, in neurasthenic states, it has lately been demonstrated that counts of six or seven millions per cubic centimeter are not infrequent, yet the physical condition of the patient, together with his hemoglobin, is below par. The determination of hemoglobin is of little value from a prognostic standpoint in the various blood affections proper, but in the simple anemias, from whatever cause, it possesses decided importance. It is the consideration of these latter states that we propose to take up here.

In very few diseases, if any, does anemia occur with such rapidity as in malarial fevers. Nor is this a matter of surprise when we reflect upon the enormous number of spores set free with each paroxysm. Many of these spores penetrate a red corpuscle, and eventually the result is a destruction of their hosts. The hemoglobin is transferred during the growth of the parasites into minute pigment granules, and these latter are disposed of in various ways; some are deposited in the solid organs, notably the liver and spleen; others become changed into urinary and bile pigments, and as such are for the most part thrown off from the system. The effect of this would become almost a mathematical problem were it not that other factors come into play. Many of the organisms fail to mature extracorpuscular parasites; many are destroyed before sporulation; immense numbers are taken up by the leucocytes in the spore stage. Were it not for these facts an attack of malaria would invariably be attended with fatal results after a few paroxysms. With the exhibition of quinin, the majority of cases (the intermittents at any rate) become not cured but convalescent, and the problem now changes to that of improving the nutrition, in other words the abolition of an anemia necessarily present. The usual tonic treatment, iron, quinin, strychnia, Fowler's solution, is instituted, and it becomes necessary to note the effect, if any, of our drugs, especially iron, that the dosage may be regulated and the patient not given more than can be utilized. This can be best done and in a truly scientific manner by determining the hemoglobin percentage. It need not be done oftener than once a week, and even a slight increase during that time will show to the physician that his patient is progressing in the right direction. The estimation is easily and quickly made with the hemometer of Fleischl, but where that instrument is not available another simple and exact method can be substituted. This method of Hammerschlag, as it is called, depends for its working principle on the difference in specific gravity of two fluids, the one heavy and the other light, neither of which will mix with fresh blood. Chloroform and benzol are the ones usually employed. They are thoroughly mixed in sufficient quantities of each to make the united specific gravity 1059, that of the normal blood. A drop of blood is allowed to fall into this mixture, which has been poured into a wide-mouthed test tube. As said before, the blood will not mix with either of the two fluids, and if the specific gravity of the blood is less than that of the mixture the drop will float. Benzol must then be added until the blood remains stationary in the surrounding medium. If the drop sinks, add chloroform until it rises and becomes stationary as before. The specific gravity of the mixture when the drop becomes stationary indicates the specific gravity of the blood under inspection. The specific gravity of the blood bears a definite parallel ratio to the amount of hemoglobin, so that the normal specific gravity, 1059, corresponds to the normal amount of hemoglobin, 100 per cent. With this as a working basis, a number of tables have been formulated—which can be found in any work on the blood—illustrating the amount of

hemoglobin and the corresponding specific gravity. The most suitable of these tables is that of Schmaltz, in which a specific gravity of 1030 represents 20 per cent. of hemoglobin and a specific gravity of 1045.5, 50 per cent, from which figures alone the ratio can be arrived at approximately. The only contra-indication to the efficacy of this test is a pathologic condition which will increase individual corpuscular weight without increasing the amount of hemoglobin. This occurs in dropsies of all kinds and from whatever cause, and in this class of diseases reliance must be placed on the hemometer. Any of the simple anemias, and the causes producing them are legion, may be readily studied by the above method, and the value of the treatment demonstrated, so that often a favorable prognosis can be given, where without this aid the attendant must be in grave doubt. One other caution must be observed. In syphilis there is always, in the active stage of the disease, more or less anemia. If, to a syphilitic who has not been treated with inunctions or injections, such treatment is instituted, a rapid fall in the percentage of hemoglobin usually takes place, often as high as 10 to 20 per cent. Under active treatment, if not pushed to a great degree, the hemoglobin will return to its original percentage, and under a careful administration of mercurials even increase, so that by estimating the hemoglobin at frequent intervals, and changing the dose to suit the condition of the hemoglobin, we may soon be able to so regulate our dosage as to bring about continuous improvement in our patient. It may be well to add that this peculiar behavior of the hemoglobin to mercurials does not occur except in syphilis, and in such a case is a valuable diagnostic as well as prognostic point.

THE HISTOLOGIC CHANGES PRODUCED BY THE VENOM OF POISONOUS SNAKES AND LIZARDS.

There is quite a remarkable resemblance, in many respects, between the toxic substances produced by microbes, by certain plants, as well as by certain animals. It has been well established that animals can be made immune, not only against microbic toxins, but also against venoms of different origin. Thus, EHRLICH has immunized animals against ricin and abrin, and CALMETTE against the poison of venomous snakes.

There are also certain chemic resemblances between the toxins of various origin, especially in their feeble resistance to heat. There has also been found a certain similarity between the lesions produced in the animals killed by these various poisons. The changes produced in the tissues by the poisons of serpents and lizards have, however, not received very much attention, if any. NOWAK'S[1] recent experimental study of the histologic alterations produced by snake venom and by the poison of lizards is therefore especially interesting.

The effect of these poisons upon the body depends not only only upon the toxicity and quantity of the venom, but also upon the manner in which they are introduced. The subcutaneous inoculation does not produce rapid death. On the contrary, if the most minute quantity of the venom of the cobra is inserted into the marginal vein of the rabbit's ear, instantaneous death follows. In this respect the toxic substances from snakes and lizards differ very much from the microbic and certain vegetable toxins. It is well known that the toxins of tetanus and diphtheria require a certain length of time after the introduction before the first symptoms of poisoning leading to death develop. If the poisons of snakes and lizards are injected subcutaneously, the dose may be so arranged that some of the animals die very soon after the injection, others after a few hours up to several days.

NOWAK experimented with guinea-pigs, mice, rabbits and dogs. Macroscopically it was especially noticeable that after death caused by snake or lizard poison, the parenchyma of the liver was friable, yellowish and congested. Similar changes were also present in the kidneys. The microscopic changes were more striking. Their principal seat was the liver, kidneys, and the lungs.

In the liver the change consisted in a typic fatty degeneration of the liver cells, which in some cases resulted in total disintegration of the cell. When the deaths followed very soon after the injection, the protoplasm of the cells was swollen and granular. After a few hours vacuoles and other changes of a degenerative character occurred in the interior of the cells. The quantity of chromatic substance diminished, and the nuclei would lose their affinity for stains. These degenerative changes often lead to total disintegration of the structure of the liver (necrobiosis).

In the kidney there occurred a fatty degeneration of the epithelium, but not to such a degree as in the liver. It was generally confined to the convoluted tubules. Occasionally some fatty changes occurred in the endothelial cells of the glomeruli. Swelling and granular disintegration of the epithelium also took place.

In the lungs, areas of congestion developed, together with desquamation of the epithelial cells of the alveoli and migration of blood corpuscles. At times the number of white corpuscles would be so great that the pneumonia presented a purulent character. The inflammatory changes in the lungs were most marked in the animals that lived for some hours after the injection.

NOWAK calls attention to the similarity of some of these changes to those produced in yellow fever. This fact has already been emphasized by SANARELLI in his work on this disease. NOWAK failed, however,

[1] Annales de l'Institute Pasteur, Juin, 1898.

to find any lesions in the digestive tract as characteristic as those which occur in yellow fever. The inflammatory changes in the lungs are also less marked in yellow fever.

The results of the study of the effects of the poisons upon the nervous system are to be published later.

IMMIGRATION AND INSANITY.

It is now many years since Dr. FOSTER PRATT in a notable study of the United States census statistics showed that the foreign born furnished an altogether undue proportion of the insane and criminals in this country and drew the inference from this fact that, to some extent at least, we were being burdened with more than our reasonable share of European defectives by immigration. Notwithstanding the lapse of time since his publication, something of the same state of affairs still exists, and the opinion has become widespread that it is due, at least in part, to a deliberate unloading of foreign insane and criminals upon our shores. It is well known that this has been done to a certain extent, but whether this goes far to account for the excessive proportion of foreign born in our asylums and prisons is another question. In New York City, the great gateway of immigration, the admissions to the Manhattan State Hospital, which comprises all the public institutions for the insane in that vicinity, the foreign-born admissions for the past ten years are nearly twice as many as those of the native born. This may perhaps be credited to the assumption that, as New York is the chief port of immigration, the defectives have a tendency to be sifted out on the spot, only the more vigorous mentally and physically passing on to the interior or Western States. Allowing this to be partially true, we have, however, still another fact to explain, that is that in the interior or Western States where there is a large proportion of immigrant foreigners in the population they furnish more than half the admissions to the asylums. This is still true in Minnesota and California, and probably also in Wisconsin, and was until quite recent years also the case in large sections of other States such as Illinois. The proportion of immigration to population has decreased, but the disproportion of foreign-born asylum inmates still exists.

When we consider the numbers of these foreign-born insane, and especially when we observe them as they are found in our public institutions, it is impossible to assume that any very large number of these were deliberately unloaded upon us as defectives. A few have certainly been assisted emigrants, but the great mass are unquestionably from the average of their countrymen and not originally more defective than them, so far as any apparent probability and available evidence can show. It would appear therefore that immigration has directly promoted and increased insanity.

Mr F.B. SANBORN, the Massachusetts philanthropist, discusses this subject at some length in a paper read before the Conference of Charities at its last meeting. While he admits that many facts seem to indicate that immigration has furnished us with a class of persons more liable to insanity than are the native born, he calls attention to another fact that, at first sight might seem somewhat contradictory to such a view, namely, the increase of insanity whence the immigrants come. In Ireland, for example, while the population has steadily decreased since 1851 to the amount of nearly 30 per cent., the number of insane has nearly trebled. To come down to more recent times, the same steady decrease of population has continued; the population, which in 1880 was 5,202,648, was in 1896 only 4,560,378. But the total number of insane, which in 1880 was 12,982, had risen in 1896 to 18,966, an increase of nearly 50 per cent. At the same time the Irish immigrants to this country were furnishing an altogether undue proportion of the insane in our hospitals, thus producing the apparent paradox of a country getting rid of its insane by emigration and at the same time and *pari passu* with its decrease of population increasing its home contingent of insanity.

Mr. SANBORN'S method of accounting for these facts is not altogether a satisfactory one. He assumes that the emigration, while it carried off the most vigorous and younger class, also included the majority of those at the ages in which mental disease is most likely to occur, while it left in the home country the aged and infirm, those who actually furnish the greater number of mental breakdowns. This last fact would be undoubtedly a valid cause for a proportional increase of insanity in Ireland, for example, but it gives no good excuse for this actual excessive increase with a decreased population. And while we may admit that most cases of insanity occur among the young or middle-aged, it is so because they furnish the bulk of the population, and it does not by any means account for any existing excess of Irish insane in Massachusetts asylums as Mr. SANBORN seems to think. It is a common saying "that it is a poor rule that won't work both ways," but his application of it here appears to have its defects.

Mr. SANBORN'S observations would seem to have been more restricted than one would suppose when he says that the Germans and Scandinavians in this country appear to be less liable to insanity than the native born. If he would consult the statistics of the asylums in the States where these nationalities abound and compare them with those of the general population of the United States census he would see the fallacy of such a generalization. It certainly is hardly correct to say that "the German and Scandinavian settlers in the rural States of the northwest seem to show fewer cases of insanity than the native born;" the fact that over 50 per cent. of the insane in a State like Minnesota are of foreign birth and

largely of these races, is sufficient evidence to the contrary.

One cause adduced is possibly effective to a certain extent, but will hardly suffice to account for the whole of the excess of foreign-born insane in this country. The personal habits as to intemperance are unquestionably not so good amongst the foreigners as amongst the native stock, but the difference is more comparative than absolute.

We are forced to fall back on one great general cause for the increase of insanity here and elsewhere, viz., the stress of modern civilization, the greater demands of modern life upon the brain and nervous system. In Europe with its more crystalized social systems, so to speak, large sections of the population, the lower classes especially, have been living under conditions in which the rapid progress of the century has had little effect upon them, and these have furnished a large proportion of the immigrants to this country. Transplanted here and placed on the very advance crest of the nineteenth century, as regards practical life, it is little wonder that many more of them break down, especially when we consider the hardships, disappointments and other trials that many of them must undergo. If this is not alone sufficient to account for the excess of foreign born in our asylums, something may be attributed to the effects of climate as bearing upon habits of drinking, etc., and there are doubtless still other causes efficiently acting of which we may as yet know little or nothing.

The increase of insanity in this country is only an incident to its increase throughout the civilized world. Civilization has altered and redirected the ordinary processes of social evolution and we are here even more than elsewhere in transition, and immigration is one of the active elements in the process.

Mr. SANBORN'S conclusion that immigration of itself is not one of the factors in the increase of insanity in the United States is not supported by the facts.

AN ARRAIGNMENT OF THE ARMY MEDICAL DEPARTMENT.

Since all the particulars of the battles near Santiago, Cuba, and the conditions prevailing among the sick and wounded at Siboney and on homeward bound transports have become known to the country, the daily press has been urging the necessity of an investigation to fix the responsibility for these distressing conditions. Editorials have appeared charging the Major-General commanding the expedition with reckless neglect of the welfare of those disabled by the exposures and exhausting labors of the campaign. Other writers have imputed the status to incompetency on the part of the Quartermaster's Department; but by most the Surgeon-General's Office at Washington and the Medical Department at the front have been arraigned as responsible for needless suffering by their inability to realize and meet the necessities of the occasion. It is claimed, 1, that the expedition sailed from Tampa, Florida, to Santiago, unprovided with the field supplies which would manifestly be required in the event of a battle; 2, that owing to the inefficiency of the medical officers accompanying the expedition even those supplies which had been shipped from Tampa were not available when required; 3, that notwithstanding these deficiencies army medical officers declined the proffered assistance of the American National Red Cross to help remedy them, and lastly, that the shipment of soldiers, wounded and prostrated with fever, on transports which, from their construction and grossly insanitary condition, were unfit for hospital purposes, showed a culpable carelessness on the part of the Medical Department which was aggravated many fold by a failure to provide medical attendance and suitable medical and subsistence supplies for use while en route.

As to the first charge, we learn from medical officers that SHAFTER'S army, while at Tampa, was provided with everything necessary for efficient medical and surgical service in the field, and that medicines, dressings, instruments, hospital tents and supplies, were loaded on the transports in quantities more than sufficient to meet the needs of the Santiago campaign. The bulk of the supplies were shipped in connection with the field division hospitals, but accompanying each regiment were regimental supplies largely in excess of the regimental needs, as these supplies were intended, in case of necessity, to supplement the division hospital equipment.

To appreciate the groundlessness of the second charge we must understand some of the conditions pertaining to the disembarkation in Cuba. The troops were immediately marched in the direction of Santiago, and the medical officers serving with regiments, having no means of transporting their medical supplies, had to leave these behind on the transports, and were bereft of all resources except such as were to be found in the orderly and hospital corps pouches of their attendants and in the first-aid packets carried by the soldiers. The partially unloaded transports were ordered to lie-to ten or fifteen miles off the landing to be out of the way of the unloading of other transports. Those carrying the equipment of the First Division Hospital and of the Reserve Hospital of the Army joined the naval blockading squadron off Morro Castle and were not permitted to return to land their supplies until five or six days later, the fight at Guasima having taken place meanwhile. The difficulties and delays experienced by medical officers in getting supplies to the front were very great, in view of the fact that no wagon transportation up to this time had been landed. Hospital tents were much needed, but there was no possibility of getting them from the transports. Even much later, when the Hospital Ship *Relief* arrived, it was found impossible

for several days to land her supplies on account of the heavy surf and the want of proper facilities. At the landing-place there was but one lighter, which was constantly in use by the Subsistence Department in getting rations ashore. By the energy and untiring efforts of the officers of the Medical Department their supplies were ultimately landed, although such work is no more their special duty than is the building of an ambulance wagon or the manufacture of a hospital tent.

As to the third charge, the proffer of Red Cross supplies was of no value unless associated with the means of landing and transporting them to the front. What was lacking to the Medical Department at the time was not supplies—for there were supplies on every transport in sight as well as on the *State of Texas*—but the means of getting these supplies to the points where they were required.

In considering the reported condition of the *Concho* and other transports used in bringing home sick and wounded soldiers it is to be remembered that the Medical Department can do no more than recommend. Its officers may inspect and suggest needful alterations to fit the vessel for its proposed voyage, but commanding officers can overrule their suggestions. Were the outfitting of extemporized hospital transports in the hands of the Medical Department we may be sure that they would be as excellent in their way as the Hospital Ship *Relief*, which was fitted out under medical officers concerned in the despatch of the sick and wounded, but we feel confident that when the facts are learned it will be found that what was considered to be an imperative military necessity occasioned the use of unfit and unprovided vessels, just as it occasioned the landing of the troops and their advance to an engagement with the enemy without any consideration save that of the military purpose in view. Opinions may differ as to whether the accomplishment of the purpose justified the method of its accomplishment.

NOSTRUM MANUFACTURERS AS FRENCH "STATESMEN."

The decadence of the French Republic under the sway of speculative commercialism is most ominously evident in the fact that an opulent nostrum vendor now occupies the position in the recently appointed BRISSON Ministry which was refused a decade and a half ago by the distinguished physiologist, PAUL BERT. Dr. BERT (like Dr. OLIVER WOLLCOTT, one of the medical signers of the Declaration of Independence, who long remained an authority on finance) was a man of admitted skill in political economy. The recently accepted French minister of finance (M. PEYTRAL) owes his reputation chiefly to his success as a manufacturer and promoter of patent medicines.

M. PEYTRAL, after attempting to form a ministry of his own, lately accepted at the hands of BRISSON the portfolio of finance. He is the first patent medicine "fakir" who has ever held a cabinet position in France. His fortune was made in the manufacture and sale of quack nostrums and the promotion of quack nostrum companies. He pretends to be a representative "business" man of the radical stripe which panders to the bourgeois ideals of supposed thrift (or rather parsimony) of the speculative commercial classes. Until he secured his election as senator, he distinguished himself by puerile poses of the following type: On one occasion, on the eve of a general election, when stumping Marseilles he blatantly pointed out that his rival had come from Paris in a sleeper, whereas he, like a true democratic bourgeois, had traveled in a third-class carriage. The fact, however, was that he also had journeyed in the sleeper and had only quitted this for the third-class car at the last station before Marseilles.

Nostrum-vending is in France even more disreputable than in the English-speaking countries. The *Code Républicaine* nominally prohibits the traffic, and only by evasions of the law, such as FLAUBERT pointed out in "Madame Bovary," can it be carried on. The patent medicine vendor is in France, for this reason, a species of confidence operator in a traffic without the pale of the law. The fact that such an individual should be allowed to juggle with French finance is most significant evidence that the "business" quacks (who caused the downfall of France at Sedan) are again in the saddle. Furthermore, it demonstrates that the welfare of the country is again being sacrificed to "business" interests as represented by avaricious contractors. Meanwhile the question naturally arises, what has become of that sturdy element of the French medical profession which so often exercised such a potent influence for good during all three of the French republics, and especially during the first decade of the present one? Great Britain has significantly elevated the deservedly criticised social status of her medical profession by creating LISTER a Peer for services to medical science. France, once foremost in her reverence for science, has of late fallen so far behind in this particular, that the downfall of even the present pretense of republican forms seems foreshadowed by this triumph of a most degrading form of illegal charlatanism over the once politically potent French medical profession.

CORRESPONDENCE.

WAR CORRESPONDENCE.

THE MEDICAL DEPARTMENT OF THE ARMY IN THE CUBAN CAMPAIGN.

BY LIEUT.-COL. NICHOLAS SENN, U.S. VOLS.,
CHIEF OF THE OPERATING STAFF WITH THE ARMY IN THE FIELD.

NEW YORK, Aug. 1, 1898.

DEAR DR. HAMILTON—

In an editorial of last week's *Record* Dr. Shrady made an unwarranted attack on General Sternberg. The General tele-

graphed me to reply to it. I have done so, and send you original copy, for which I ask a very early publication in your journal in justice to the General and his Department.

I leave for Porto Rico tomorrow on the steamer *Relief*. On the way down I shall have something to say on the reorganization of the Army. I will send you paper from Ponce. Hoping that you are well, I am, with kindest regards,

Yours sincerely, N. SENN.

ON BOARD THE HOSPITAL SHIP "RELIEF," July 31, 1898.

In an editorial of the *Medical Record* of July 30, suspicions are thrown out reflecting on the efficiency, foresight and proper management of the Medical Department of the Army during the Cuban Campaign. The remarks made by the editor are based, as he himself asserts, almost exclusively on a correspondence which appeared in a recent issue of the *Sun*. In commenting on this article the editorial states: "If the report is true, and there seems to be no good reason for doubting it, the Army Medical Department appears in a very unenviable light. It is said that there was a total lack of everything necessary for the proper care of the stricken soldiers. Why this was so it is hard to explain, especially in view of the fact that the war department has constantly declared, in declining voluntary assistance from charitable organizations, that it was abundantly able to cope with any possible emergency in the field, and yet this is the result." The correspondent of the *Sun* made bold in saying: "It was evident that the Medical Department of the Army had failed absolutely to send hospital supplies, or by this time they would have been landed. On the one hand it was pitiful. On the other, it was negligence that could have been the result only of incompetence." I am sure if the editor of the *Medical Record* had been better informed he would not have been so willing to lend his ear to a newspaper correspondent whose success nowadays consists largely in tinging facts with more or less imagination and sensationalism. The medical men inside and outside the army have little, if any, influence over the lay press, but the editor of a medical journal of such high standing with the medical profession throughout the entire country as has been willingly accorded the *Medical Record*, should take the necessary pains to investigate more thoroughly the circumstances which dictated the editorial before casting any reflections whatsoever on the chief of the medical department. Dr. George M. Sternberg is no stranger to the medical profession and the American people. He occupies the exalted position of Surgeon-General of the United States Army, not by political preferment or gradual ascent by promotion, but by merit. President Cleveland made a wise selection when he made the appointment. It was a selection that met with the heartiest approval on all sides. General Sternberg knows from long and actual experience what it is to be a soldier in the field. He has been there. He served with distinction during the War of the Rebellion. He has followed the unruly and wily Indians over plains and mountains during many a campaign. He has investigated yellow fever at home and abroad, regardless of his own health and life. Since he has been placed in charge of the Medical Department of the Army he has been tireless in making many much-needed improvements.

The Army Medical School is one of the many fruits of his labors. He has taken special interest and pride in promoting the intellectual and professional advancement of his young army surgeons, assigning them for temporary duty in large cities, where they could enjoy clinical instruction and laboratory work. He has taken a deep and active interest in the organization and usefulness of the Association of Military Surgeons of the United States, and served most acceptably as president. Last year he was honored by the profession by election to the Presidency of the AMERICAN MEDICAL ASSOCIATION. The earnest devotion to his duties made it impossible for him, to his great regret, to attend the Denver meeting. The name of General Sternberg is often seen on the programs of scientific societies from the Atlantic to the Pacific and from Labrador to the Gulf. He crossed the Atlantic, last summer, to represent his Government at the International Congress, held in Moscow, Russia, and his work there added much to the luster of American medicine. The Surgeon-General, now so unjustly accused of incompetency, not only is accorded a well-deserved place in the front rank of the profession, but his administration shows executive talents which have served him well during the present campaign. He has shown good judgment in the selection of his advisers. Colonels Alden, Greenleaf and Smart, are all men of large experience and admirable executive abilities, as all can testify who have been brought in contact with them. The charge of incompetence and ignorance certainly lacks foundation in the case of General Sternberg and his administration. Now, as to facts. The correspondent of the *Sun* who furnished all the material for the editorial referred to goes on to say: "The wounded were carried back from the fighting line on stretchers, and laid on the ground to wait until the surgeons could reach them. Many were soon beyond the need of surgical treatment. There were four divisions of the army, and each division was supposed to have its hospital; but as a matter of fact there was but one, the division hospital of the Fifth Army Corps, under Major Wood. There were five surgeons, a hospital steward, and

Brigadier-General George M. Sternberg, Surgeon-General of the Army.

twenty assistants, to care for the wounded—several hundred. They had a number of operating tables, a small supply of medicines, but few bandages, and no food for sick or wounded men. It was comparatively easy to get supplies from the *State of Texas* ashore to the hospital here (Siboney), but there was no transportation to the front." In the opinion of the editor of the *Medical Record* and the correspondent of the *Sun* the Red Cross Association's work was the only redeeming feature of the whole campaign, to judge from the language of the latter: "God knows what we should have done here without the help of the Red Cross—your ship, your surgeons, and your nurses! and there is no other help for us at the front. Our wounded up there must have food, bandages, anything you can let us have in the line of hospital supplies." The editorial in the *Medical Record* brings matters to a focus in the closing extract: "It is right and proper that the Surgeon-General should resent any interference with his prerogatives, but he should not directly invite it by making possible such

condition of affairs as here described." This inference is entirely unwarranted by facts as they existed during and after the battle of Santiago.

The correspondent and editorial do not even mention the steamer *Olivette* we found July 7 anchored close to the shore before Siboney. This steamer, in command of Major Appel, U. S. A., was used as a hospital ship. This ship was in place and ready to receive the wounded during the battle. The steamer, at the time mentioned, had on board 300 wounded, who received the best surgical attention and nursing. The next day the steamer left for the United States, the medical staff being reinforced by the addition of Acting Assistant-Surgeon Brown of Chicago from the *Relief*. General Sternberg at an early date recognized the importance of hospital ships during this war. The *Olivette* was chartered for this special purpose, was well equipped and reached the seat of war in time. The hospital ship *Relief*, formerly the *John Englis*, under the supervision of its commander, Major Torrey, was transformed into an ideal floating hospital in less than six weeks and reached Siboney July 7, a day before the *Olivette* left for its home port. Do these things show either negligence or ignorance? Do they not rather demonstrate foresight and an earnest endeavor to better care for the sick and wounded in a way creditable to our country and the chief of the Medical Department? This question can safely be left for the wounded to answer. The Surgeon-General accepted the legitimate services of the Red Cross Association and had reason to expect aid from this source, should pressing emergencies present themselves. The medical officers, the wounded and the sick have every reason to be grateful to Miss Clara Barton, for what she did in furnishing ice, delicacies and medical supplies. The *State of Texas* did excellent work in aiding the Medical Department, but that is no reason why those connected with the Red Cross Association should claim all the credit and undertake to criticise a department of the government which has done all it possibly could in anticipating the requirements of a sudden emergency. It is a source of great regret that there should be any friction whatever between the Medical Department and the friends and supporters of the Red Cross Association. It must be clear to every unprejudiced mind that the treatment of the sick and wounded must remain under the direct care, control and management of the Medical Department, and that the function of Red Cross is rather auxiliary to it than as an independent organization if the greatest amount of good is to be realized from it. The hospital ship *Relief* brought an immense amount of medical supplies, delicacies, cots, pillows and blankets. When we arrived at Siboney we knew our presence was much needed, and looked in vain for some one to inform us where and how to land. The precipitous and rocky nature of the shore and the great depth of the ocean made it unfavorable to secure anchorage for several days. A single lighter attended to the demands of numerous transport ships. I am sure no one could blame the Medical Department for the unavoidable delay in unloading the supplies. The little steam launches did what could be done in bringing to the shore what was most needed. Major Torrey worked night and day in supplying the requisitions made by the surgeons in the field and hospitals. There was no red tape here, all they had to do was to inform him what was wanted and it was delivered as soon as it could be brought to the shore. The lack of proper transportation facilities from the landing to the front can not be charged to the Medical Department. It took more than a week of the hardest kind of work to land all of the supplies, and, considering the limited facilities available, it is and always must be regarded as a source of satisfaction that it was made possible at all. The *Relief* brought 1000 cots and an ample supply of bankets, which reached the hospitals with as little delay as possible.

Lieut. Crabbs of the 8th Cavalry, showed a creditable degree of ingenuity, energy and often of courage in landing the supplies. The complaint that the sick and wounded lacked medicines and dressing materials is true only to a certain extent. Some of the medicines were exhausted, owing to the unexpected enormous demand, but they were supplied as quickly as could be done under the existing circumstances. The writer had the privilege to operate in all of the hospitals and was always able to find the essential antiseptics and dressing materials required in military practice, and this was at a time when the supplies were at the lowest. There was no lack at any time of stimulants and anesthetics. There is no use in denying the fact that immediately after the battle the tentage and blanket supply were inadequate, but these defects were corrected promptly. War always has had its hardships and discomforts; it can not be prosecuted in parlor cars and clubhouses. Or soldiers expected deprivations and unavoidable discomforts, but on the whole they were subjected to less actual suffering than they had reason to look for. To the credit of the medical officers it must be said they shared the inevitable hardships with the soldiers. They lived on the same food, drank the same water and made the moist ground their beds. The writer will always cherish the memory of the hardships incident to a campaign in a foreign country, a tropical climate and among a strange people. The Cuban campaign was planned and executed so quickly that some omissions and defects had to be expected. It is a source of gratification to know that the complaints made against the medical department have come from newspaper correspondents and camp followers more than from the soldiers themselves. Among the thousands of sick and wounded with whom I have been brought in contact during the Cuban campaign I have seldom heard a complaint; on the contrary, I have heard nothing but words of praise for the hard working, self-sacrificing medical officers and the department they represent in the field.

Ice-Water Enteroclysis in Typhoid Fever.

TOLEDO, OHIO, Aug. 1, 1898.

To the Editor:—After having had favorable results with ice-water flushings of the bowels in the lowering of high temperatures in typhoid fever, I have wondered that greater stress is not laid upon the use of the measure by those who write upon the treatment of that disease.

The cases are few in number in which I have had the opportunity to test the practice, and it may be that these few cases were such as would have done well under the Brand method, the wet pack, or any other plan of refrigeration; indeed, such is doubtless true.

For several reasons though, my practice, limited as it is, leads me to look upon ice-water enteroclysis as superior to any other method of lowering the temperature which I have seen used.

In the first place, fever patients need much more water than they in their semiconscious condition are likely to ask for, or than they will drink when it is offered them, and it is always the fact that there is less water passed into the bedpan than was forced into the bowel.

I place this reason first because I believe it is important that these patients take into the system more water than they are accustomed to drink even in health, and sterilized water to which has been added common salt, thrown into the bowels, is a rational way of meeting a vital requirement.

I do not know how high the water ascends in the bowels, but that it does hasten the removal of poisonous material from the bowels there can be no doubt. I believe, too, that subsequent injections ascend higher than the first ones did, the bowels becoming more accustomed to the water. The formation of intestinal gases is diminished by the cleansing of the bowel, and the soft rubber rectal tube frequently reaches an

accumulation of gas, thereby relieving a troublesome tympanitis as well.

Patients are not frightened or fatigued by the operation, but, on the contrary, so far as can be told by the expression of countenance, and by their general condition, are made more comfortable by it.

When the temperature is low, nervous manifestations are usually quiet, but whether this quiet is caused by a direct influence upon the nervous system or whether the nervousness is secondary to high temperature is a matter for individual speculation, but I believe that the heat centers are quite as apt to be influenced for good by the abstraction of heat from the interior of the abdominal cavity as they are by radiation from the surface of the body.

Enteroclysis is much easier to administer than is any kind of bath, and hence is much surer of being properly attended to. The technic is simple.

A long, soft, rubber catheter is slipped upon the ordinary hard tip, a napkin is tightly wound around the tip until a hard ball is formed which is to be pressed against the anus to prevent the ejection of the enema. The catheter is oiled with petrolatum and as soon as the tip has entered the anus the water is permitted to flow and, by rotating the catheter to and fro with the fingers, it floats upward as the water expands the intestine, and used in this way it does not double upon itself, or cause rectal irritation. The instrument is retained in the bowel for twenty minutes, the nurse maintaining pressure upon the anus during the time, and when the water is allowed to come away it is found to have the temperature of the bowel. The fountain should not be higher than a foot above the patient's body.

The patient weighs 150 pounds and his temperature is 105 degrees, $150 \times 105 = 15{,}750$. Water, four pounds, at 32 degrees, is introduced. The heat which this abstracts from the body is the difference between 32 degrees and 105 degrees $\times$ 4=292. The original heat units, $15{,}750 - 292 = 15{,}458$; $15{,}458 \div 150 = 103$; and it has been my experience that the axillary temperature a half hour after the enema could be predicted with almost the above mathematic exactness.

J. S. TRACY, M. D.

306 W. Woodruff Ave.

Flannel Underclothing for Soldiers.

CLINTON, ILL., Aug. 6, 1898.

To the Editor:—There has been a good deal said of late about our soldiers in Cuba wearing abdominal bandages, "cholera pads" to protect them from diseases of hot climates. I do not think much of the pad. I think it would be better protection and more sensible to furnish each man with two pairs of flannel drawers, which would protect the soldier's legs as well as his abdomen. The extra pair could be kept dry and clean ready for a change and would make but little additional weight or bulk to carry.

I agree with Surgeon-General Sternberg that the field is no place for female nurses. They are all right in the local hospitals, but the battle-field and on the march is not their place. It was so during the Civil War and it can not be otherwise in the war with Spain.

JOHN WRIGHT, M.D.

Proposed New Designation.

SAN DIEGO, CAL., Aug. 3, 1898.

To the Editor:—With the advent of a new century the time is propitious for dropping such meaningless appellations as "Old School," "Regular," "Allopath," etc. Why not, henceforth adopt the eminently distinctive and appropriate title, "New School of Scientific Medicine," suggested by Surgeon-General Sternberg in his recent address at Denver?

Faithfully yours,

C. M. FENN, M.D.

ASSOCIATION NEWS.

Comment on Association Proceedings.—In connection with the proceedings of the Association of American Medical Colleges published in this number, it is well to note a resolution adopted by the AMERICAN MEDICAL ASSOCIATION, which is far reaching in its effects. The resolution was introduced by Dr. Dudley S. Reynolds of Louisville, the president of the Judicial Council of the College Association; it was referred to the business committee, approved by it, and adopted with no opposition. (For resolution *vide* JOURNAL, July 9, p. 83.) The resolution practically makes a new qualification for membership for every County society in affiliation with the AMERICAN MEDICAL ASSOCIATION, since one cannot enjoy the full privileges of membership unless he is eligible to serving his society as a delegate to the AMERICAN MEDICAL ASSOCIATION, and it is a question whether the Association was competent to adopt it in this form, for it is, in effect, an amendment to the constitution. It is not to call attention to this structural weakness but rather to its dynamics. That a resolution of this character could be presented to two successive general sessions of the AMERICAN MEDICAL ASSOCIATION and not be adversely discussed, even by the benevolent advocate of the poor young man who must struggle to enter the profession at all, and therefore should receive a training making many of his classmonuments of ignorance and incompetency, seems almost too wonderful to be true. Whatever may have been the private opinion of many who kept silent, public sentiment is in favor of a fitting educational period for the intending physician. We congratulate the College Association on their having the stamp of approval set upon their own standard, and, which is a source of greater gratulation, the decision of condemnation upon any course less thorough than their own.—*Bulletin Am. Acad. Med.*, August, 1898.

Politics in the American Medical Association.—If one may judge by the tone of a recent editorial in the *Ohio Medical Journal*, in spite of the fact that Columbus is the meeting-place of the AMERICAN MEDICAL ASSOCIATION for next year, there is not an abiding peace in the minds of the profession of that State. There is a good deal of truth in the statement of the *Ohio Medical Journal* that "the political part of the convention continues to be managed by medical politicians: these gentlemen constitute a sect apart, come chiefly from St. Louis and Louisville, and come with everything cut and dried," but granting it, there are many who will not give the matter the prominence which it evidently receives at the hands of our contemporary. Most of the members attend the sessions of the AMERICAN MEDICAL ASSOCIATION for other reasons and with other purposes than to engage in political bickerings, and are only too glad that there are some who are willing to do this work for them. If they think they are running the show, let them think so as long as the performance continues; they get but an empty honor, forgotten before the next session, and have a great deal of labor for their pains. While they are doing this work the rest of us can meet and chat with friends, attend Sections, visit places of interest and enjoy ourselves. The men who are so unfortunate as to be elected to office will earn all they get from the honor, scores of times over, before next June.—*Atlantic Med. Weekly*, August 6.

Resolutions Submitted to the American Medical Association at the Denver Meeting, June 8, 1898, by W. H. Sanders, M.D., Health Officer of Alabama. (*Vide* JOURNAL, No. 2, Vol. xxxi, pp. 85 and 95, July 19, 1898). Finally referred to the Business Committee:

WHEREAS, The protection of the public health is one of the duties and functions of all well-organized and progressive governments; therefore, be it

Resolved, 1. That it is the sense of this body that a public health system correct in principle, complete in detail and appli-

ble alike to every part of the country, should at the earliest ne possible be created and put into vigorous operation.

2. That in order for such a system to be constitutional, cohe- nt and permanent, it should logically conform to the genius d plan of our concentric systems of government, that is to y, its roots should be deeply planted among the people, the cognized source of governmental power under our constitu- on, and its branches should reach up through, and be sus- ined by, every political division of our State governments to e central and resourceful power, the Nation.

3. That to lay the foundations for such a system the States ould formulate their policies of public health with sufficient iformity as to render them susceptible of being united into e symmetric and harmonious whole, and to lead up to, and rminate in, one central and co-operative head, viz., the gen- al government acting through a bureau of public health.

4. That while the officials for actively conducting a public alth system should be of local origin and authority, and erefore directly and proximately responsible to the people, e States and the Nation should co-operate with the local thorities in furnishing the expert skill and financial aid cessary for suppressing dangerous contagious and epidemic iseases when they appear in any given locality, and for pre- nting their spread from one part of a State to another part f the same State, or from one State to another State.

5. That the principles herein announced should apply to e theory and practice of quarantine, which, although an portant part and function of a public health system, is not e only one of its numerous and beneficent powers. To divorce e exercise of quarantine power from a public health system, d to confer it upon a separate organization which derives its istence and vitality from the general government, and not om the people of the States, would be to emasculate and ulti- ately to destroy said system, as well as to overthrow one of e most sacred and valued principles upon which our govern- ent is founded.

6. That an earnest appeal is hereby made to the Congress of e United States to recognize the principles herein proclaimed s constitutional and unassailable, and as in thorough accord ith the generic truths out of which our political fabric has been evolved.

SOCIETY NEWS.

American Public Health Association.—The Twenty-sixth Annual Meeting of this Association will be held at Ottawa, Ontario, Sept. 27 30, 1898. The executive committee has selected the following topics for consideration:

"The Pollution of Water Supplies."
"The Disposal of Garbage and Refuge."
"Animal Diseases and Animal Food."
"Car Sanitation."
"Steamship and Steamboat Sanitation."
"The Etiology of Yellow Fever."
"The Relation of Forestry to Public Health."
"Demography and Statistics in their Sanitary Relations."
"The Cause and Prevention of Infectious Diseases."
"Public Health Legislation."
"The Cause and Prevention of Infant Mortality."
"Transportation of Diseased Tissues by Mail."
"The Period During which each Contagious Disease is Transmissible and the Length of Time for which each Patient is Dangerous to the Community."
"Sanitation, with Special Reference to Drainage, Plumbing and Ventilation of Public and Private Buildings."
"Report upon some Method of International Arrangement for Protection Against the Transmission of Infectious Diseases."
"Disinfectants."
"To Examine into the Existing Sanitary Municipal Organizations of the Countries Belonging to the Association, with a View to Report upon those most Successful in Practical Results."
"The Duties and Responsibilities of the Healthy Man for his own and others' Health."

Upon all the above subjects special committees have been appointed. Papers will be received upon other sanitary and hygienic subjects.

Southern Indiana Medical Society.—The Annual Meeting will be held at Indian Springs, Ind., Aug. 11 and 12, 1898. George Knapp, M.D., President, Vincennes, Ind.; T. A. Hays, M.D., Secretary, Burns City, Ind.

PUBLIC HEALTH.

The Sale and Importation of Saccharin and other similar sweetening substances; dulcin, crystallin, etc., have been forbidden in Austria to all but druggists.

"To see Ourselves as Others see us" has been recently applied in the campaign against alcoholism in Germany. Drunken men are followed home from the saloon and photographs taken of their most disgusting and humiliating poses. The photographs are then presented to the subject when sober, with a warning circular.

Health in Michigan.—The report of the State Board of Health for July cites rheumatism, diarrhea, neuralgia, bronchitis and tonsillitis as the five most prevalent diseases of the month. Compared with the preceding month, dysentery, cholera infantum, cholera morbus, diarrhea, inflammation of the bowels and intermittent fever increased, while influenza, pleuritis and measles decreased in area of prevalence. The Board celebrated its quarter centenary August 9, 10 and 11.

Health in Indiana.—The diseases most prevalent throughout the State for July were typhoid fever, diarrhea, intermittent fever, dysentery and cholera morbus. As compared with June, the diseases which increased in prevalence were mostly water-borne diseases, as typhoid, dysentery, cholera infantum, inflammation of the bowels, diarrhea, intermittent fever and puerperal fever; those showing decrease were "house diseases," *i. e.*, such as are due to bad ventilation, *e. g.*, rheumatism, tonsillitis, bronchitis, whooping-cough, etc.

Bubonic Plague on the Island of Formosa.—The Japanese physicians have been making a careful study of the small epidemic of fifty cases, which is summarized in the *Arch. Klin. de Bordeaux* for June. There were 22 deaths: 4 natives, 4 Japanese soldiers and 42 laborers. Constipation was the rule in three-fourths of the cases; the rest had a yellow diarrhea, but there was no albuminuria nor pneumonic expectoration. The blood contained, besides the bacilli, an exaggerated number of white corpuscles. The prognosis depended upon the condition of the heart, which grew weaker and weaker until final collapse about the fourth day. Camphor and quinin proved absolutely ineffectual. An abrasion of the skin was only discovered in six cases. The liver was hypertrophied in six, and the spleen in nearly every case, but these conditions were ascribed to preceding malaria or beriberi. If the patient survived five days recovery was probable.

Prophylaxis of Gonorrhea.—The recent German Dermatologic Congress concluded its long discussion of gonorrhea with the recommendation that in view of the present unsatisfactory results of treatment it is important to educate the public, especially young men, to realize the dangers and far-reaching results of gonorrheal infection. As prophylactic measures, instillations of silver nitrate or of 20 per cent. solution of protargol and glycerin immediately after coitus, were advised, and especially the use of a condom. Neisser and others confirmed their previous endorsement of protargol as the most effective and least irritating of the silver salts, but for chronic cases the stronger argentamin is desirable. For women Neisser prefers ichthyol and urethral pencils. The importance of commencing treatment as soon as possible after infection was strongly urged. Neisser and others consider matrimony allowable when repeated examination fails to show any gonococci, but a few take the ground that marriage is impossible as long as any urethritis persists.

Osteopathy in Indiana.—An interesting contest between the Indiana State Board of Health and the osteopathic school of physicians has just come to a close in Lafayette (July 30). Some weeks ago Dr. Gott of Crawfordsville, a member of the Board, called the Board's attention to the fact that the osteo-

paths practicing in the State had not taken out either State or county license, as required by the new State medical law. The osteopaths stated that they were not engaged in the practice of medicine and were not required, therefore, to take out license. They furthermore urged that even should they apply for license, the State Board would refuse it. The State Board is made up of representatives of the allopathic, homeopathic and eclectic schools, and it has been its policy to refuse the application of all who are not regular graduates of one of the three schools. When the osteopaths defied the Board, it was decided to make a test case, so Dr. Woodruff, who had recently come from the Institute of Osteopathy at Kirksville, Mo., and located at Lafayette, was arrested for not taking out a license before engaging in the practice of medicine. The trial of the case was bitterly contested, both sides being represented by the best counsel in the State. The court found Dr. Woodruff guilty as charged, and fined him $40. Woodruff has taken an appeal to the supreme court, and will endeavor to have the law declared unconstitutional. The State Board will cause the arrest of all other osteopaths practicing in Indiana.—*Globe-Democrat*, St. Louis.

The New York Quarantine Station has imposed upon it a stupendous task, which it barely meets, owing to the arrival of the various army hospital vessels from southern latitudes where yellow fever is a constant menace. The *N. Y. Tribune* gives a cut of the disinfecting boat, the *James W. Wadsworth*, on duty alongside a newly arrived steamer. Dr. Alvah H. Doty, the health officer of the port, has long since discarded alleged disinfections by sulphur and substituted steam in lieu thereof, a method first suggested by Dr. Edward R. Squibb of Brooklyn, N. Y. At first there were many obstacles to be overcome, but finally the present apparatus, in use for two years, fulfilled all expectations. The *Harvard*, the largest vessel disinfected, underwent the process in two days' time, and thus saved to the Government hundreds of dollars a day in the speedy release to her duties. Under the old process two or perhaps three weeks would have been consumed. The vessel in question, it must be remembered, according to Dr. Doty's account, had about 500 men aboard, every one of whom had clothing and bundles by no means above suspicion. The steam used had a temperature of 230 degrees F. or over, but formaldehyde gas is also resorted to in instances where injury by steam to fabrics, such as silk, laces, leather goods, etc., would result. Other devices for the prevention of communication by the development of incubative cases are used.

NECROLOGY.

CHARLES S. WARD, M.D., Yale, 1863, formerly of New York City, died July 31, aged 55 years. He was a member of many associations, among which were the University Club, the St. Nicholas Society and the Society of Colonial Wars. Having retired from a very active practice several years ago, he took up his residence in Bridgeport, Conn., where he died. He was noted for his quiet charities and benefactions.

CHARLES MORRIS FISCHER, M.D., Oakland, Cal., professor of histology of Cooper Medical College, San Francisco, Cal., died July 29. Dr. Fisher was taken sick about five weeks ago and his illness rapidly developed into typhoid fever. He was a native of Pennsylvania, 32 years of age, went to the Coast several years ago and soon after his arrival was made assistant city superintendent of schools. During his college days he became deeply interested in the study of histology and about four years ago, when the chair of assistant professor of histology became vacant, was chosen to fill the vacancy. Later, he was made professor, with the retirement of the former incumbent of the chair.

EDWARD LEWIS STUREVANT, M.D., Harvard, 1866, died at his home in Framingham, Mass, July 30. He was born in Boston, Mass., Jan. 23, 1842, was graduated from Bowdoin College in 1863, served as a captain in the Twenty-fourth Maine Volunteers during the latter year, but left the army for a medical career. As an expert in scientific agriculture he was connected with the United States government for many years and in 1881 took charge of the New York State Experiment Station at Geneva, where he remained for six years. Besides his many contributions to agricultural papers he edited *The Scientific Farmer*, 1876–79; *The North American Ayrshire Register*, and, with Joseph N. Sturtevant, published "The Dairy Cow," a monograph on the Ayrshire breed of cattle.

GEORGE C. HUBBARD, M.D., New York University Medical College, 1857, died August 3, at his home in Tottenville, Staten Island, N. Y., of which town he had been a resident for forty years. On January 1 he was appointed assistant sanitary superintendent of the health board, which placed him in charge of the Staten Island branch. After serving in the Civil War as assistant surgeon and subsequently as surgeon of the One Hundred and Sixty-fifth Volunteer Infantry, he returned to Tottenville and resumed practice, succeeding his father. He was for many years physician at the Mount Loretto Mission of the Immaculate Virgin, where there are from 800 to 1000 boys. In 1890 he was appointed a member of the Richmond County Police Board and continued in that place until 1896. From 1893 until 1895 he was president of the County Board of Excise. He also served as health officer of the town of Westfield and of Tottenville during its village history.

JOSEPH M. COCKRILL, M.D., Baltimore, Md., July 23, aged 50 years.——Joseph B. F. Fuller, M.D., Norwich, Conn., July 31, aged 87 years.——Theodore H. E. Gruel, M.D., Philadelphia, July 31, aged 52 years.——Joseph M. Klecfus, M. D., Detroit, Mich., July 30, aged 40 years.——E. T. Long, M.D., Bethlehem, Ky., July 21, aged 78 years.——Henry Mullen, M.D., Philadelphia, July 31, aged 64 years.——Thomas Murray, M.D., Beaver, Pa., July 31, aged 89 years.——Ed. B. Oatman, M.D., O'Fallon, Ill., July 30, aged 51 years.——Jacob S. Shimer, M.D., Philadelphia, July 27, aged 62 years.——T. R. Odell, M.D., Spokane, Wash., July 1, aged 82 years.——W. D. Boker, M. D., Astoria, Ore., July 1, aged 53 years.

DEATHS ABROAD.—Dr. Carlo Giacomini, professor of anatomy in the University of Turin, aged 57 years.——Dr. Victor Michaux, surgeon to the Civil Hospitals of Metz, aged 70 years.——Dr. C. Dufay, formerly senator for the Loir et Cher, president of the Medical Association of that Department.——Dr. Ernest Cadèze, medical superintendent of the Lunatic Asylum of Liége and a very distinguished entomologist, aged 71 years.

BOOK NOTICES.

Exiled for Lese Majestie. By J. T. WHITAKER, M.D. Cloth. Cincinnati: Curts & Jennings, 1898.

A little love story endeavors to hide the true purpose—a series of remarks on literature, art, medicine, astronomy and kindred topics, chiefly in the form of conversation between the three leading characters. Their talks and readings are blended with apt quotations, in the handling of which the distinguished author is an acknowledged master. In his remarks on medicine he has woven many neat sentences that will soon be "familiar quotations." "Medicine must be a fascinating study." "The science of it is. Practice is very different." Again: "The redeeming element in practice is the diagnosis; that is the knowledge of the nature of disease." "I should think it would be the cure." "The people judge a physician by the results of his treatment; but physicians judge each other by the correctness of the diagnosis." "What is the objection to the practice of medicine? It must be one of the highest of arts." "So it is; but as an art it is subject to

debasement, and still more so as a trade. The charlatan is of all creatures the vilest. He is the vampire who sucks the blood of the sick; but the people at large do not know it, and they rarely draw the lines. Regular, irregular or defective, they are all doctors." A physician when pressed for a more favorable prognosis is made to say: "Only the charlatan is always certain." Again: "The physician does not pretend to still the storm; he is simply a pilot, who is satisfied to steer the ship through." "But the pilot sinks with his ship," said the librarian. "The physician's reputation goes down, too," replied the doctor, "and often under the decrees of Heaven, over which he has no control." In speaking of the death of a famous emperor, "He had the fatal consultation of the whole faculty." "If there was as much difference of opinion among medical men with regard to the treatment of disease as among bankers concerning the remedy for financial distress, or among scholars as to the interpretation of a difficult passage, the human race would long since have become extinct. But it is good to know that the medical men have their day, if it is only the last day." "But why don't you teach your patients?" "They want to be cured only; they don't want to be taught." "There is more in the blood than we have dreamed of in our therapy."

Atlas of Syphilis and Venereal Diseases, including a Brief Treatise on the Pathology and Treatment. By Prof. Dr. Franz Mracek of Vienna. Authorized translation from the German. Edited by L. Bolton Bangs, M.D. Pp. 122. Philadelphia: W. B. Sanders. 1898. (From W. T. Keener, Chicago Agent.) Price $3.50 net.

The clinical material figured in this book is drawn from the service of Dr. Mracek in the Rudolfo Hospital in Vienna; this will be recalled as the hospital made famous by the lamented Billroth. The plates are lifelike and the material comprising the clinical cases quoted is such as to be very instructive. The careful study of the clinical statements and the examination of the plates will amply repay students and practitioners. The glance through the book is almost like actual attendance upon a famous clinic.

Handbook of Materia Medica for Trained Nurses, including the sections on Therapeutics and Toxicology and a Glossary of terms with dose and use of each drug. By John E. Groff, Ph.G. Pp. 235. Philadelphia: P. Blakiston's Son & Company, 1898. Price $1.25 net.

The text of this book presents an abridgment of the subject of materia medica and there are questions appended to each chapter. There is an extensive glossary at the end. The work is intended primarily for students and trained nurses, but any medical man can read it with advantage.

Lectures on Tumors. By John B. Hamilton, M.D., LL.D., etc. Third Edition. 21 Illustrations. Pp. 143. Philadelphia: P. Blakiston's Son & Company. 1898. Price $1.25 net.

The last edition of this book was published in 1892, and many changes have taken place in the pathology of tumors, which have been mentioned in this volume, not included in its predecessors. The work has been greatly enlarged; almost rewritten.

The illustrations are mostly original, and the classification followed by the author is the last revision of the nomenclature of the Royal College of Physicians. Of considerable interest is the latest theory of the origin of the dermoid cyst by parthenogenesis, and Ruffer's description of his microbe of carcinoma.

The publisher has apparently spared no pains to secure the typographic excellence of the volume.

The Retrospect of Medicine. Edited by Jas. Braithwaite, M.D., London. Assisted by E. F. Trevelyan, M.D., B. Sc., M.R.C.P. Cloth. Pp. 436. Vol. 117, January-June, 1898. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd.

This half-yearly volume contains the usual retrospective view of discoveries and improvements in the medical sciences during the period covered. The abstracts from articles appearing in medical journals during the half year are arranged under the heads of "General Medicine and Therapeutics," "Diseases of the Nervous System," "Diseases of the Organs of Circulation," "Diseases of the Organs of Respiration," "Diseases of the Organs of Digestion," "Diseases of the Urinary Organs," "General Surgery and Therapeutics," "Nervous System," "Alimentary Canal," "Affections of the Eye and Ear," "Affections of the Skin," and "Obstetrics and Gynecology." The volume is up to its usual standard of excellence.

The Mental Affections of Children; Idiocy, Imbecility and Insanity. By William W. Ireland, M.D. Pp. 442. London: J. & A. Churchill. Edinburg: Jas. Thin, 1898. Price, $4.00, net.

Those who read the author's former book on idiocy and imbecility will recognize a great deal that was in that work, but the present work is more elaborate and treats more exhaustively of the condition.

The pages on the development of the brain in childhood, the pathology of genetous and paralytic idiocy, sclerotic and syphilitic idiocy and that on insanity of children are new and not contained in the former.

This work deals with statistic causes of idiocy, and takes up at length the question of hereditary and, indeed, idiocy in all the phases.

The author strenuously objects, as do most philanthropists of the present day, to the practice of placing idiots in wards with the insane, and takes up the question of their careful treatment and final restoration to the body politic. The neglect of the States and failure to provide sufficient accommodations for this unfortunate class, is as a rule, owing to the absence of accurate knowledge as the exact amount of benefit that can be secured for them. Such books as this have therefore an important mission in popular education.

A Manual of Bacteriology, Clinical and Applied, with an appendix on bacterial remedies, etc. By Richard T. Hewlett, D.D., M.R.C.P., D.P.H. Pp. 439. Philadelphia: P. Blakiston's Son & Company, 1898.

In this manual the author has endeavored to give some account of those portions of bacteriology which are of special interest in clinical medicine and hygiene. The preparation of tissue, methods of culture, description of pathogenic organisms and their detection, the examination of water, etc., have therefore been given at some length. The direction for staining and preparation of cultures, in the examination of air, water, blood, etc., are fully discussed.

This book will be very useful for those whose laboratory facilities are limited.

Thirty-Seventh Annual Report of the Cincinnati Hospital. Paper. Pp. 178. Illustrated. Cincinnati: Commercial Gazette, 1898.

This report covers the year ending Dec. 31, 1897, contains a description of the Cincinnati Hospital, reports of the various officials and the branch hospital with detailed tabulations concerning various cases of typhoid fever, acute rheumatism, pneumonia, hernia, etc., occurring in the hospital.

Twelfth Annual Report of the State Board of Health of Ohio. Cloth. Pp. 508. Illustrated. Norwalk, Ohio: Laning Printing Co., 1898.

Besides the usual matter pertaining to sanitary questions, this report contains a number of papers of interest. Among others we note "A Report on the Treatment of Diphtheria with Antitoxin," "What Can be Done for the Prevention of Consumption," "Evil Results of Present Educational Methods," "Present Position of Formaldehyde as a Disinfectant," and "Tuberculin Test for Tuberculosis in Milch Cows."

Handbook for the Hospital Corps of the U. S. Army and State Military Forces. By Charles Smart, Deputy Surgeon-General, U. S. A. Approved by the Surgeon-General of the Army. Second Revised Edition. 12mo. pp. 358, illustrated, blue muslin, $2.25 net. New York: William Wood and Company.

This is the third revision of the well-known handbook of

Colonel Smart and deserves a place in the library of every military surgeon. As its author is an accomplished chemist, it is natural to expect that the chapters on sanitary care of camp, etc., would be of the highest order.

The appearance of the book is timely and it will be found of great use to the medical corps in the field.

A Compend of Diseases of the Skin. By J. F. SCHAMBERG, M.D. Pp. 137. Philadelphia: P. Blakiston's Son & Company. 1898.

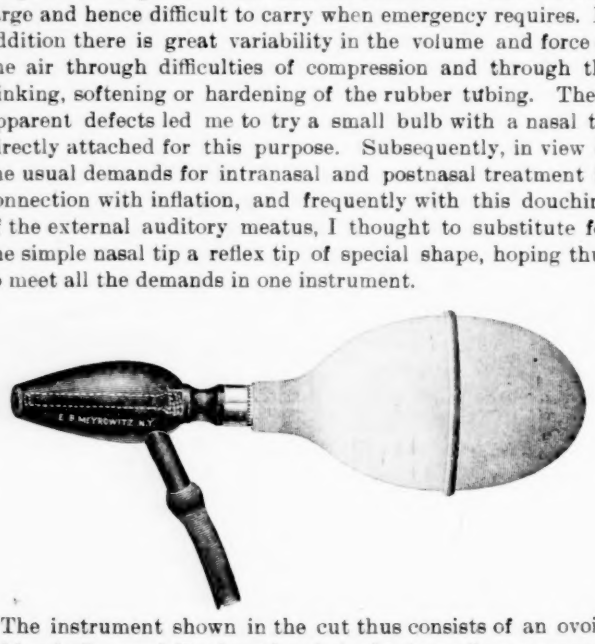
There are ninety-nine illustrations in this volume. The illustrations are excellent and the text up-to-date. The student will find this as useful as any of its much derided but nevertheless very necessary class.

NEW INSTRUMENTS.

A COMBINED EUSTACHIAN INFLATOR AND EAR AND NOSE DOUCHE.

BY WILL WALTER, M.D.
CHICAGO, ILL.

The use of the Politzer air-bag in Eustachian inflation is decidedly clumsy and not entirely satisfactory for several reasons. It is necessary to hold the nasal tip in one nostril and to exclude the other with one hand, that the other may be free from pressure upon the air-containing bag; while, too, the shape of the bag is awkward and the whole instrument unduly large and hence difficult to carry when emergency requires. In addition there is great variability in the volume and force of the air through difficulties of compression and through the kinking, softening or hardening of the rubber tubing. These apparent defects led me to try a small bulb with a nasal tip directly attached for this purpose. Subsequently, in view of the usual demands for intranasal and postnasal treatment in connection with inflation, and frequently with this douching of the external auditory meatus, I thought to substitute for the simple nasal tip a reflex tip of special shape, hoping thus to meet all the demands in one instrument.



The instrument shown in the cut thus consists of an ovoid rubber bulb, specially shaped and sized to be easily compressed by the hand, attached to a hard rubber reflex tip, to the return flow portion of which is applied a piece of small tubing. The latter may be in length according to the desire of the patient. The tip is adapted as well as possible to meet the needs of both nose and ear, fitting the average external orifices as well as may be done by one instrument. The instrument should prove of value for Eustachian inflation, as it may easily be held to the nostril and compressed by one hand, while the other hand holds the opposite nostril, the exit tube being closed.

As an ear douche, its simplicity, convenience and cleanliness of application would commend it for hot douching of the external meatus.

As a nasal douche it may be used for douching the nares in cases where there is pathologic or post-operative occlusion and it is desired to cleanse the parts, and this it will do much more readily than the spray. By entirely compressing the exit tube a nasal douche, easily regulated in force and area of application by variation in pressure, may be attained. Few physicians do not, at times, need to restore the normal pressure to the middle ear, and this is most advantageous when early employed. The compactness of this instrument, together with its varied uses, would seem to commend it for routine use in practice.

103 State Street.

MISCELLANY.

Globulicidal Properties of the Tapeworm.—Schauman and Tallqvist report that the bothriocephalus latus, whether derived from an anemic or non-anemic person, contains a true blood toxin.—*Deutsche Med. Woch.*, May 19.

The Fifth International Congress for the Study of Potable and Mineral Waters, Climatology and Geology, will be held at Liège, Belgium, from September 25 to October 3. Secretary, Dr. Jorissenne, Boulevard de la Sauveniére, 130, Liège.

Prof. William H. Welch has resigned as dean of the Johns Hopkins Medical School. Dr. Welch does not sever his connection with that institution, for he will retain his position as professor of pathology.

Consolidation of Colleges.—The consolidation of the Atlanta Medical College and the Southern Medical College under the name of the Atlanta College of Physicians and Surgeons, is announced. This will be the only regular medical college in Atlanta.

From a Study of the Agglutinating Power of Cholera Vibrios, Ransom and Kitashima have demonstrated that the agglutinating power of a cholera culture can be modified at will without appreciably affecting its virulence or other characteristics, by varying the specific cholera serum.—*Deutsche Med. Woch.*, May 12.

Inflammable Stomach Gases.—Dr. Drouet relates that he was recently examining the throat of his three-year-old child with a tongue-depressor, by the light of a candle, when the gases rising from the stomach caught fire and burned for a moment with a bluish flame, slightly singeing the doctor's mustache and the child's lips.—*Jour. de Méd. de Paris*, July 3.

Pus in the Pelvis.—Johnson (*Am. Jour. of Obstet.*, July) believes that the majority of bad pelvic pus cases, etc., could be more quickly evacuated through the vagina than through the abdomen, and at the same time done more easily, completely and safely. He reports twelve cases tending to emphasize this conviction.

Bile Not Secreted by the Liver.—Barbera concludes from numerous tests on dogs with biliary fistulas that the bile is not a secretion of the iver: the functions of the liver do not include the secretion of bile, which is merely an excretion of the liver cells, its production depending upon the work of the cells.—*Munch. Med. Woch.*, May 24.

In 104 Total Extirpations of the Uterus for carcinoma at the Landau Clinic, 27 per cent. have shown no signs of recurrence during the five years since; 32 per cent. have relapsed. Neither youth nor extreme age seems to be absolute counter-indications for an operation. He has had three fistulas persist. He recommends completing the operation at one sitting and removing both ovaries every time.—*Munch. Med. Woch.*, May 17.

Congenital Pelvic Kidney.—Cragin (*Am. Jour. of Obstet.*, July) reviews the literature on this subject and and adds one case to the few already reported. obstruction of the parturient canal resulting. His conclusions are: Pelvic kidneys may cause dystocia; induction of premature labor is indicated as a rule; in rare cases, where the pelvic kidney is in a condition of hydronephrosis, vaginal nephrectomy may be advisable. In the writer's case vaginal nephrectomy was performed.

Official Privileges Extended to Women Physicians.—A recent decree places women occupying official medical positions in Russia on the same footing as men, with the exception of promotions, wearing uniforms and decorations. They do not lose their right to a pension if they marry, and their orphan children inherit it. The decree only refers to a limited number who completed their medical course under certain circumstances. Woman has long been legally on an equality with man in Russia.

Pride Before a Fall.—Pedagogic father is trying to show off his supposed precocious boy before company.—"My son, who would you rather be, Shakespeare or Dewey?" Little son meditates awhile and says, "I'd rather be Dewey." "What, my son; and why?" "Cause he ain't dead."—*New York Weekly.*

The Importance of the Role of the Phagocytes is much enhanced by the new discoveries in regard to their action in tetanus intoxication. They not only destroy the bacteria, but owing to their property of absorbing all the solid particles they encounter, they absorb and render harmless the tetanus toxin if it is combined with a solid substance, such as brain matter. These facts show that the leucocyte is capable of destroying a microbe even when it is secreting a virulent toxin.

The Absorption of Calomel by Leucocytes after injections into the tissues proceeds very rapidly where the circulating current is rapid and where they reach it before its transformation into mercuric chlorid. In the subcutaneous and muscular tissue the leucocytes merely surround the calomel without absorbing it or carrying it away. The transformation, therefore, only occurs at the point injected, and is promoted by the fluids of the organism. Vaselin holds the calomel in suspension longest and is absorbed by the subcutaneous connective tissue in one minute.—G. Piccardi, *Derm. Cbl.*, April.

Stricture of Small Intestine.—In the *Phila. Med. Jour.* of July 9, Matas presents an illustrative case of multiple stricture of probable tubercular origin, within thirteen inches of the jejunum. He performed enterectomy by Maunsell's method, not applicable in all cases, *e. g.*, contraindicated in case of very thick or inflamed mesentery, where he considers Czerny-Lembert or other simple suture methods preferable. The case is of interest from the almost insurmountable difficulties of diagnosis before operation, the high position of the lesions, the period of evolution of the stenotic process, twenty years, and the apparent cure.

Porro Operation vs. Total Hysterectomy.—Boldt writes on this subject in the *American Journal of Obstetrics* for July. He believes total hysterectomy should be performed in preference to supravaginal hysterectomy with extraperitoneal treatment of the pedicle; never be performed unless absolute indications are present, and the child being dead *in utero*, the uterus should be removed *in toto* unopened. He considers the advantages of total hysterectomy over the Porro operation as less danger of infection, no danger from secondary hemorrhage, less danger from intestinal obstruction, shorter convalescence and less danger of ventral hernia.

Sharp Practice.—Lady V. (At office of fashionable Harley Street consultant.) "I have called, Doctor, to ask if there is any cure for sleep-walking of several years standing. Lately it has become worse."

Dr. Hy Pryce: "It can be cured, madam. Take this prescription and have it filled at Cold, Steele & Co's."

Lady V.—"Cold Steele & Co.? why, that is not a drug store; it is a hardware firm."

Dr. Hy Pryce.—"Yes, madam. The prescription calls for a paper of tacks. Dose, 2 tablespoonsfuls scattered about the floor before retiring."—*Vanity Fair.*

This was for the purpose of puncturing her *tire.*

The Central Nervous System in Acute Anemia shows the effect of the intoxication from an insufficient supply of oxygen, as the red corpuscles decrease in number. In a case Scagliosi has recently studied, uterine hemorrhages persisting thirty-four days in an otherwise healthy woman in the eighth month of pregnancy, the evidences of the lack of nutrition were very pronounced. In the brain cells the Nissl cell-corpuscles had crumbled into fine granules, and the accessory nucleus had a hole in or near the center, close to the wall. The atrophy and chromatolysis of the ganglia cells of the spinal cord were accompanied by diminished staining power on the part of the crumbled Nissl corpuscles. He adds that it would be impossible for cells thus degenerated to take up the oxygen, even if it could then be supplied them.—*Deutsche Med. Woch.*, May 19.

La Societe d' Autopsie is an offshoot of the Paris School and Laboratory of Anthropology and it is difficult to overestimate the importance of its work in the study of the organs of men who were prominent and widely known in science, art, literature, politics, etc. Gambetta is the subject of the latest report issued by the society. It contains his "psychologic biography; the brain and the function, with the authentic history of his disease and death," and throws a remarkable light on the organic substratum of Gambetta's superiority as an orator and extemporaneous speaker, as it shows that the foot or "cape" of the third left frontal convolution, the verbal motor par excellence, was double in him.—*Bull. de l'Acad. de Méd.* June 21

Unorganized Charity.—The medical profession is about the only calling in life that is not, or need not be, dependent upon organization to enable it to give safely, wisely and quickly. The needy are always with us, and all that is needed is a plenty of this world's goods and a kindly temperament, for, as the poet says:

So many gods, so many creeds,
So many paths that twist and wind,
While just the art of being kind
Leaves all the other arts behind.

Orthoform in the Organism.—It has been demonstrated in Leyden's clinic that besides its local anesthetic effect, orthoform is absorbed in the stomach and eliminated (not pure) through the kidneys, relieving pain in the urinary passages in acute gonorrhea and cystitis; dose 1 to 1.5 grams a day, preferably in a solution. In the urine it responds to the same tests as the amido-phenol group, most marked with chromic acid, and also produces the ring characteristic of pyramidon. The amido-phenol leaves the organism paired with sulphuric acid, shown by the much increased amount of "ether sulphates." Orthoform also has the property of preventing the putrefaction of albumin. After the ingestion of orthoform the urine can stand for days without ammoniac putrefaction.—*Deutsche Med. Woch.*, June 30.

A Waiver of Privilege.—The first appellate division of the supreme court of New York holds, in the personal injury case of Rauh vs. The Deutscher Verein, that the plaintiff, having submitted evidence, whether it be the testimony of the plaintiff herself or of another witness present, of the transaction between the patient and physician, waived the privilege of excluding the physician's testimony; and the truth of what happened, and what was ascertained by the physician in his examination and the treatment of the patient, can be testified to by the physician. A different rule, it thinks, would work the greatest injustice, and would expose the defendant to danger on account of the fact that the rule would prevent him from examining into the truth of the plaintiff's statements.

A Colossal Roentgen Plant.—Professor Trowbridge of Harvard University has completed a vastly powerful apparatus for experiments in electric force, his principal object being to test further the penetrating power of the X-ray. The apparatus consists of a series of 120 Franklin plates, or leyden jars, supplied with power by a storage-battery containing 10,000 plant

cells. The voltage necessary for experiments is 2,500,000. It is reported that he has already made experiments which prove that with an apparatus as powerful as this the X-rays can be made to penetrate not only human flesh but bones and tendons, thus probably making possible still more remarkable attainments in surgery by their aid.

Enforced Higher Education.—The Association of American Medical Colleges, which is an organization first brought into actual existence by Dr. Eugene F. Cordell of Baltimore, has done a noble work in raising the standard of medical education in the United States, and in gaining for our country the respect and admiration of foreign medical schools and physicians. There are some schools in this country, however, which did not join this association, and which still "cut rates," so to speak, and by shortened courses and various tricks carefully omitted from mention in the annual catalogues and announcements, help to lower the standard of medical education in this country. In order to force these schools into the association and make them the equals of all the good schools, the AMERICAN MEDICAL ASSOCIATION has passed very practical resolutions declining to register as delegate or permanent member any physician who shall hold the position of teacher or professor in these low-grade schools, or who shall be a graduate of such schools. If the AMERICAN MEDICAL ASSOCIATION has the grit to stick to this resolution, and will not be overpowered by the political members of the association, the effects of this rule will have a very salutary effect on the poorer schools.—*Maryland Med. Jour.*, July 23.

Removal of Health Officers at Pleasure.—Physicians appointed as health officers for cities, towns and counties "may be removed at any time by the local boards appointing them," under section 2060 of the Kentucky Statutes. This, the court of appeals of that State construes, in Riffe vs. Finsby, to be equivalent to power of removal at pleasure or discretion, though the general rule is that a person appointed or elected to an office, the term of which is prescribed, cannot be removed therefrom, by even the appointing power, except upon trial of charges preferred, and of which he has notice. Nor does it consider that the case is altered by a city ordinance fixing the term of office of the health officer, whether valid or not, though it is suggested the ordinance would be beyond the power of the city to pass, the State statute not fixing any term of the office in question, and it being plainly the policy of the legislature that there should be no term of such office, and the incumbent should be, for manifest reasons, removed at the pleasure of the board of health.

Fibroma of the Nasopharynx.—Woodson (*Laryngoscope* for August) believes that few, if any, cases of nasopharyngeal fibromata occur which cannot be successfully extirpated or destroyed without endangering the patient's life. He says: "The mode of operation has little or no influence in preventing symptoms, because the tendency to recurrence is marked during the period of active development; the arrest of development follows adolescence, but absorption frequently takes place, when total extirpation of the growth is rarely followed by recurrence." He considers hemorrhage a great danger in operating, and that the galvanocautery loop, while exceedingly rapid, fails to absolutely prevent serious hemorrhage. On the other hand, the cold-wire *écraseur* is bloodless, painless and easily manipulated, and the instrument *par excellence*. He does not advise the injection of escharotics, on account of the density of the growth requiring considerable time for the separation of the slough and also causing offensive odor.

The Sequel of a Druggist's Revenge.—The London *Lancet* cites a case before a provincial police court, in which a small boy who had been swinging on the supports to the blinds of a druggist's shop, after capture had been liberally dosed with an infusion of quassia. The druggist was fined properly, says the *Lancet*, on the following grounds: the next mode of punishment might not be so harmless as quassia and the executioner might be less instructed in therapeutics. Again, an element in the way might be imported into the punishment of children which should never be tolerated, towit, the element of nervous terror. "We know and the druggist knows," says our contemporary, "that the solution of quassia was as harmless as, say, many sorts of table beer, but the boy did not know it. He might easily believe that his disagreeable sensations were the prelude to impending death from poisoning, and a fond mother might possibly support the view, with the result that much more pain and of a different sort, would be caused than was intended." Although there is a dash of casuistry mingled with the heavy humor of the bar we hope that the controversy is now at an end, especially since the deterrent factors of stronger blinds or increasing weight of years may be the safeguards.

Hemorrhagic Internal Pachymeningitis.—In the *American Journal of Medical Sciences* for August, Herter writes on this affection as it occurs in children, believing that the lesion is sufficiently frequent to deserve more attention than it has hitherto received. From his own observations he says: "I do not feel certain that there is any symptom or combination of symptoms which we meet in hemorrhagic internal pachymeningitis which we may not occasionally encounter in the course of a severe acute infection without the presence of any cerebral lesion whatever. At the same time hemorrhagic pachymeningitis is a lesion which we should think of as a possibility whenever we meet with unilateral rigidity and convulsions, with deepening stupor, in a cachectic or rachitic child under one year of age. In the absence of the signs of pneumonia and tuberculosis, I think this diagnosis gains distinctly in probability." Another aspect to which he calls attention is the probability of slight traumatisms to the head, causing rupture of vessels in a highly vascular membrane, giving these cases thus a medico-legal importance.

Puerperal Sepsis.—Mundé, in his presidential address recently delivered before the Am. Gyn. Society (*Am. Jour. of Obstet.*, July), said: "Unquestionably in the large majority of cases of puerperal sepsis in private practice the infection comes from the fingers or instruments of the physician or the nurse; and this statement applies not only to the poorer classes, but to a certain extent to those in better circumstances. It has been frequently stated that the women in well-conducted lying-in asylums are far safer from puerperal infection than those who are attended in their own houses, even though they be brown-stone fronts. This is not as it should be. It is not only the hands and instruments which may introduce infection, but also the clothing of the attendants, which may have been in contact with some infectious case and which have not been thoroughly cleansed and disinfected. . . Naturally the denuded endometrium, the more or less bruised and lacerated cervix, vagina and perineum are by far more susceptible to the entrance of septic germs than the more or less intact sexual organs during pregnancy. Retention of portions or clots or membranes does not necessarily mean their decomposition and a septic infection. In some cases he believes the septic germs, "wherever they came from and however they got there, were sucked into the gaping vagina during change of position of the patient, say from the back to the side, or *vice versa*, or after a fecal evacuation, when the relations between the pelvic viscera and intra-abdominal pressure changed so that the gaping vulva was placed in a favorable condition for the entrance of air by suction."

Value of Gratuituous Medical Treatment can not be Recovered.—That he had been put to great expense for medicines and doctor's bills, was averred by the plaintiff in a personal injury case as one of the elements of damage which he had sustained for which he should be allowed to recover compensation. But

evidence was that he had been taken to a hospital and ted there, without incurring any liability for the medicine medical attendance. Could the value of such medical tment, what would have been charged for it, if charged be made the foundation of such a claim as that stated? supreme court of Missouri holds, in the recent case of erris vs. the Grand Avenue Railway Company, that it could The proof of the value of the gratuity exerted in one's alf in relief of an injury inflicted, it maintains, is in no se the proof of the expense to which one had been put, or liability incurred, in the relief from that injury, and that ere is no warrant in law or logic for holding to the view that proof of the one state of facts justifies the finding of the istence of the other, or that proof of one raises the presumption of the existence of the other. To authorize a recovery part of the injured plaintiff, there must have been an actual s to him, or a liability that same may or will occur, and hen loss has not or can not occur, by reason of the action of thers, gratuitously exercised in behalf of the party injured, when no legal liability has arisen, by reason of restrictions of w against the intervening third party performing the needful rvices, it quotes cases to show, no action can be maintained. Nor does it consider that it is any answer to the denial of the defendant that the plaintiff has been put to expense for medical treatment to say that "the defendant in an action for personal injuries caused by his or its negligence ought not to profit by the generosity, charity, or indulgence extended to plaintiff by a third party."

Pregnancy Following Ventrofixation.—A. Laphthorn Smith of Montreal (*Am. Jour. of Obstet.*, July) reports that in his 111 ases pregnancy has taken place in six, one or both ovaries nd tubes having been left in four and both ovaries and tubes in the other two. He cites replies to 100 inquiries addressed in May, 1898, to the leading physicians in America as to whether they knew of any cases of pregnancy following ventrofixation. Of seventy-three replies received, thirty-two knew of no such cases, and the experience of forty-one aggregated 148 cases. From the evidence he concludes: 1. That as far as curing retrodisplacement, either retroflexion or retroversion or anteflexion with retroversion is concerned, ventrofixation with two buried silk stitches through the peritoneum and fascia gives the most reliable results. Failures are unknown when the operation is performed in this way. 2. Ventrofixation should be reserved for cases in which abdominal section is necessary for other reasons. . . . When it is expected that pregnancy may follow some other operation should be chosen; because, 3, when the uterus is firmly attached to the abdominal wall and pregnancy follows, trouble of some kind, either pain, miscarriage, or difficult labor requiring obstetric operations, takes place in about 30 per cent. of the cases. . . . 4. When *suspensio uteri* was performed, that is, the uterus attached to the peritoneum of the abdominal wall, a few relapses occurred. . . . 5. A third method, it is claimed by some, namely, the intra-abdominal shortening of the round ligaments, is preferable to either fixation, ventrofixation or *suspensio uteri*. After the menopause, it may be added, none of the objections urged are tenable.

Cholelithiasis of Typhoidal Causation (*vide* JOURNAL, June 11, p. 1415).—The London *Lancet*, July 9, refers to the work done by Dr. H. W. Cushing, at the Johns Hopkins Hospital, in elucidating the intercurrence of gall-bladder trouble with the presence of the bacillus of typhoid fever in the human economy. Dr. Cushing, *in primis*, has confirmed the view that the gall-bladder, like Peyer's patches, is a site of election for the typhoid bacilli. In 1891 Blachstein noticed their constant occurrence in the gall-bladder of rabbits after experimental inoculation. Later, Professor Welch discovered that they persisted in this situation; in one animal they were found 128 days after inoculation, when they had disappeared from every other organ. Acute cholecystitis may appear in the late stage of typhoid fever, but there is a group of cases in which it appears some months after the attack and always in association with cholelithiasis. The connection between typhoid fever and cholelithiasis was first pointed out in 1889 by Bernheim and has been confirmed by several writers. In professor Halsted's clinique in Johns Hopkins Hospital, ten out of thirty-one cases of cholecystitis with cholelithiasis, which were operated on, gave a history of typhoid fever, the interval varying from a few months to twenty years. Such a long interval by no means negatives the connection, for the bacillus has been found in a case of cholecystitis as late as fourteen years after an attack of typhoid fever. Similarly, abscesses of bone may follow typhoid after long intervals; in a case recorded by Buschke the interval was forty-six years and yet the bacillus was cultivated from the pus. These cases well illustrate that the germs of disease may remain latent in the body for an indefinite period, a doctrine which is only beginning to be appreciated and which has far-reaching possibilities. Dr. Cushing reports a remarkable case of cholecystitis and cholelithiasis in which chlecystotomy was performed and the typhoid bacillus found in the gall bladder, although there was no history of previous typhoid fever. The blood serum gave the typhoid reaction. The wide-spread recurrence of the typhoid bacillus has only been lately recognized. In 1892 Guarnieri first described an infection of the biliary passages, liver and spleen without intestinal lesions.

Foreign Bodies in the Ear and Nose.—In the *Medical Record* of June 11, Barret urges more careful knowledge on the part of the general practitioner as to the removal of foreign bodies from the ear and nose. He advocates the use of as few instruments as possible—a head mirror, one serrated and one rat-toothed forceps, foreign body forceps, a flexible tube, a "nest" each of aural and nasal specula, and a cotton carrier, being the essential instruments. In case of the nose he has "the mother or nurse take her seat upon a straight-backed, steady chair, with her back to the table or stand, on which the lamp is placed in such a position that the light shines over her right shoulder. Then she should take the child on her lap, clasp its limbs between her knees, and with her right arm thrown across its body secure its arms, while with the left hand on its forehead she holds its head firmly and steadily against her right shoulder. The operator then places himself in front of the patient, seating himself upon a straight chair or stool (never use a rocking chair), and with the thumb of the left hand slightly tips up the end of the nose, while the right hand so adjusts the head mirror as to throw a flood of reflected light into the nostrils. Having located the foreign body, proceed as quickly as possible to remove it before the child becomes frightened or the nervous strain upon the mother becomes too great. No force should be used under any circumstances, lest the delicate parts be seriously injured. If possible, grasp the offending body with a pair of forceps, and by gentle traction withdraw it; or very often, as in the case appended, the flexible probe may be bent in the form of a hook of suitable size and slipped past the obstruction, then turned, and the foreign body rolled along the floor of the nasal fossa, until it either drops out or can be grasped by the fingers. Sometimes it is necessary to use a nasal speculum and dilate the nares considerably before we can locate a foreign body or effct its removal. The procedure is much the same in case of the ears, but usually more difficult and great care must be taken to avoid laceration of the walls of the auditory canal. The child's head should be turned so as to bring the affected ear toward the operator, and held as directed above. A syringe and warm water may be tried, taking care, however, not to use too much force and thereby rupture the drumhead, and also to dry the ear thoroughly afterward with a little absorbent cotton on a cotton carrier. In examining the ear the lobule is grasped between the index and middle fingers and gentle traction made upward and backward,

while the thumb and index finger insinuate the speculum into the orifice with a slight rolling motion. The speculum most generally used resembles the one for the nose, except it is longer and pointed."

The Mortality of the Medical Profession.—The report of Dr. Tatham, the medical officer of the local government board, on the mortality of occupations during the three years 1890–92 has recently been issued by the Registrar-General as a supplement to the report of the Registrar-General for the ten years 1881–90. The report is one which demands careful examination, and we hope to refer to it at greater length on a future occasion. We will now only observe that Dr. Tatham reports that the number of members of the medical profession recorded in the last census of England and Wales was 18,936, an increase of 25 per cent. as compared with less than 3 per cent., which had been the rate of increase in the previous ten years. The comparative mortality figure for medical men is 966, as against 821 for lawyers, 533 for the clergy and 953 for occupied males in the aggregate. The mortality among them is higher than that of lawyers at all ages up to the 55th year. Dr. Tatham, however, has some grains of comfort, for he finds that in the three years with which he deals the diminution in the death rate of ages under 45 noticed by Dr. Ogle has continued, while at ages from 45 to 65 there has been a decrease from the high rate of 1880–82, although the mortality still remains somewhat higher than in 1871. At ages above 65 there has been a further increase in the mortality. As on the whole the increase has been at ages above 55, Dr. Tatham suggests that it may be partly due to the influenza epidemic, which was at its height in 1891, and is known to have been especially fatal to persons beyond the prime of life. It is a remarkable fact that the most frequent of all causes of death, not only in the medical but also in the cleric and legal professions, are diseases of the heart. Pulmonary tuberculosis and diseases of the respiratory system, which, in most other occupations, stand higher than any others in the scale of mortality, occupy much less important places, the mortality from bronchitis in the medical profession being not more than one-seventh of that to which the general male population is subject. The causes of death to which medical men appear to be especially liable are gout, diabetes, urinary disease and suicide. It appears, indeed, that the tendency to the commission of suicide has notably increased among medical men. The number of deaths attributed to diseases of the liver, of the urinary organs and to alcoholism has decreased. On the whole, if we omit the increase in suicide, it would appear that the death rate from causes which may be classed as preventable shows a decided tendency to decline in the medical profession.—*British Medical Journal.*

The United States Army Field-Hosptal System.—The hospital corps of an army is divided into two detachments, one of them being for service in the field hospitals, the other for manning the litters and ambulances for the removal of the wounded from the field. The laying out of the field hospital proceeds on four lines, separated by intervals that must be determined by the nature of the battlefield. The first line of hospital service is coincidental with the line of battle, and includes regimental surgeons, orderlies and company bearers. On the second line are the first dressing stations, at the nearest point beyond range of the enemy's fire. Here ambulance surgeons attend the wounds, and ambulances and litter-bearers of the hospital corps convey the wounded to the third line. This is called the ambulance station. Reception, operating and dressing tents are erected, where the wounded can be attended until they can be removed to the division hospital at the base of supplies. None of the hospital corps serves in the line of battle. The wounded are conveyed to the first dressing stations by privates from the ranks. The army regulations provide that four privates from each company shall be designated company bearers. They are taught how to handle wounded men and in first aid, in addition to their regular duties as armed combatants. They fight in the line until their services are required to attend the wounded, whom they convey to the first dressing places. There the injured are turned over to the hospital corps, and the company bearers return to their places. They are under the direction of their own officers and have nothing to do with the dressing of wounds. Their only care is to convey the wounded beyond the reach of the enemy's fire. At the first dressing stations, where the wounded receive their first attention, aside from such hasty bandaging as the regimental surgeons may be able to provide, there is a complete equipped field hospital in miniature. In the United States Army the main medical stores are carried in army wagons, but as these can not keep up with the line of battle, it is proposed that pack mules be employed to carry such supplies to the dressing stations. A medical case or pannier, so built as to fit the back of a mule, contains all the materials required, a variety of antiseptics, medicines for the relief of pain, bandages, splints, plasters and operating instruments. A cook accompanies each of the divisions, carrying a case of portable cooking utensils. As soon as this detachment reaches its station tents are pitched up, the medical cases are opened and their contents placed in readiness for use; an operating table is improvised by placing two of the folding panniers together, so that they will afford a place on which to lay the wounded while the surgeon is working over them, while the cook sets up his tent and makes ready to prepare light nourishment.

Not Liable for Leaving Fragment of Needle in Perineum.—A surgeon and physician, who holds himself out as such to the public, and accepts employment as such for pay, does so under obligations which are imposed upon him by law. He takes upon himself the obligation when he accepts such employment that he will exercise fair, reasonable and ordinary skill in the conduct and discharge of that employment. The highest possible skill is not to be expected of him, but it is expected, as the law demands of a person holding himself out as a professional man, that he shall have such knowledge, such skill, and shall exercise such care as are ordinarily exercised by men in his profession in good standing in the community in which he resides. This is the rule which the court of common pleas of Hamilton county, Ohio, took for its guidance, in the case of Eislein against Palmer, where it held, June, 1898, that, according to the evidence offered by both parties, it was manifest that the surgeon sued for malpractice had exercised all reasonable care and skill, and there was no negligence on his part. In performing an operation to remove some cicatricial tissue from the perineum, the needle used in passing the suture was broken, and the surgeon could not find the fragment by touch or sight, and speedily closed the operation, on account of the patient having become very weak under the influence of the anesthetic. Two days before the date set for the patient to receive final instructions and leave the hospital, the surgeon's horse ran away, throwing him out of his buggy upon his head, so that he was not able for months thereafter, either mentally or physically, to attend to any business. Other doctors took the case from that point, and about a year later performed an operation, finding the fragment of needle embedded in cicatricial tissue which had formed all about it, in the perineum, apparently just where it was left when it was orignally broken off. Such being the case, the court holds that a verdict in favor of the surgeon was not against the weight of the evidence or the law. It also particularly holds that the surgeon was under no obligation to tell his patient or her husband, while she was his patient, that a needle had been broken and part left in her body, but that it was his duty to tell her when he should discharge her as his patient from his care as such surgeon or physician; because to tell her would only be to endanger the success of the operation. He did not have to anticipate dangerous and unavoidable accidents, continues the court, but he had a right to expect that he would be able to attend his patient until she got well.

The Cause of Death From Electric Shocks.—In these days in which electricity is coming more and more into everyday use; in which after an accident the first thought is frequently, if not usually, as to who is responsible and from whom may financial compensation be received; and in which the association of electricity and civil suits is of common occurrence, the results of the experiments of Oliver and Bolan, carried on during the last year, and published in the *British Medical Journal* are of considerable interest. These experiments have been made with a view of ascertaining the cause of death after electric shocks, and the report includes a large amount of research into the effect upon animals of the alternating current in varying doses. The paper is illustrated by a number of records of the blood pressure, pulse and respiration of animals; before, during and after the application of the alternating current of varying voltage. They conclude as follows: "When an animal is exposed to electric currents of sufficiently high potential, death is, practically speaking, instantaneous. The animal is thrown into opisthotonos, during which breathing is suspended and the heart's action momentarily quickened and then arrested; if the current is strong enough it is stopped at once. On shutting off the current there occurs a deep inspiration usually followed by an expiratory cry. This has often been noted by workmen when one of their number has suffered a serious accident, and by it their attention is called to one who is found dead as the result of electric shock. Dogs through which an electric current has been passed, may on breaking the current, not only breathe spontaneously and rythmically for several seconds, even a minute or two, but bark loudly; and yet all the time the heart has ceased to beat. In a few experiments death has been due to contemporaneous cessation of the action of the heart and lungs. Primary cessation of the heart's beat is without doubt the general rule; while under no circumstances have we succeeded in causing primary arrest of respiration followed by a failure of the heart. They also report the testimony of workmen employed in electric generating stations; who say that it is usual for men killed by electric shock to breathe a few times after life is otherwise apparently extinct. From the facts within their knowledge they conclude that death in the electric 'chair' must be instantaneous and without pain."

Cincinnati.

Drs. Lawrence Carr and Wallace Neff have been appointed surgeons-in-chief of brigade with the rank of major.

The following Cincinnati physicians attended the late meeting of the American Medical Association held at Denver: Drs. Holmes, E. W. Mitchell, Ransohoff, Zinke, Bruhl, Conner, H. M. Brown, Hilkowitz, French, Oliver, Wenning, Bonifield, Malsbury.

Dr. J. T. Whitaker, professor of theory and practice of the Medical College of Ohio, has written a book on a non-medical subject, entitled "Exiled for Lése Majesté," elsewhere noted.

Dr. H. I. Woodburn has been appointed professor of physiology and histology of the Miami Dental College.

San Francisco.

The buildings of the Affiliated Colleges of the University of California are about completed and the moving in of the laboratory apparatus is now in process. The coming term of the Medical Department will open with the customary lectures at the old building, but the work will be transferred to the new quarters about the first of October. That this is to be the case, and that the work of completing the buildings and finishing the laboratories will not be dragged over many months unnecessarily, is entirely owing to the persistence of Dr. R.r Beverly Cole, president of the Medical School, and a forme president of the American Medical Association. He has devoted almost all his time to the superintendence of the work on these buildings for the past two years, and in addition to this by no means trifling physical work, has expended a good deal of his own money upon the buildings. Dr. Cole suffered from an attack of partial hemiplegia, about nine months ago, but as soon as he could be out of the house he was again at the college buildings seeing that the work was pushed rapidly ahead, and that all particulars of the contracts were lived up to; indeed, it is probable that this work has kept him alive for more than a year, for his health has been failing rapidly during the last two or three years. It has been the hope of every one of the faculty that Dr. Cole might live to see his heart's desire, these magnificent college buildings, finished, and the Medical School installed therein. The move to the new quarters will probably have a most beneficial effect upon the college, for it has already shown some promise of this in the added interest in the laboratories and laboratory work. The recently created Electrical Department (established a little over a year ago) will be provided with a laboratory quite unequaled for its apparatus and facilities in this country, and it is anticipated that a very large amount of original research will be done therein. One somewhat novel feature will be a course of lectures on the most recent discoveries in the line of animal electricity, which will be delivered to all the classes and will also be attended by a goodly number of physicians as well. It is quite probable that the City and County Hospital will be located near the new building of the Medical School, in which event advantages of this department of the State University will be materially enhanced.

Philadelphia.

Abuse of Charity in Hospitals.—As in all cities, the abuse of charity in Philadelphia has reached such a stage that the word "flagrant" may be properly applied, but one society after another has devised ways and means for its correction. Probably that one which will eventually prove successful is the one recently approved, which provides that persons applying for treatment shall give a statement as to their financial condition, income, etc., and having a statute enacted by the legislature making it a heavy penalty for any one guilty of making false statements. At the meeting of the Medico-Legal Society recently held here, and of which Dr. Samuel Wolfe is chairman, this subject was commented on at some length, and a plan is being formed by which an aggressive campaign will be waged along these lines in the early fall. It is then hoped to secure the indorsement of the County Medical Society and afterward have the co-operation of all medical bodies in presenting the subject properly before members of the State legislature.

Physician at Hahnemann Hospital in Trouble.—On June 29, a boy 14 years of age, while descending a ladder accidentally stepped on a nail, which ran into the center of his foot below the arch. He was taken to the Hahnemann Hospital, where the foot was dressed under an anesthetic. It is reported that he went again on two or three succeeding days and was told to come again at a certain hour July 5. On July 4 the boy received a wound of the limb by the accidental discharge of a cartridge and was taken to the Samaritan Hospital, where the part was dressed. The boy's limb was again dressed the following day, and as he informed those in charge of his engagement at the Hahnemann Hospital at 1 o'clock, he received attention early. In the lad's last statement it is reported that he reached the latter institution at a quarter to 2 o'clock, when the curator said to him, "My boy, you are too late, you were told distinctly to be here at 1 o'clock." It is said that other patients were being treated at the time, but the boy was sent away, and when he reached home was suffering great pain and had a high fever. A few days later he died of tetanus. After the boy was sent away from the Hahnemann, Dr. Cornelius, the family physician, was called in, but refused to accept the responsibility of the case and advised that Hahnemann physicians be notified. The father (a minister), on arriving at the institution, met one of the resident physicans in charge, who,

according to the father's testimony, became abusive. He stated that the object of his visit was to get some one from the hospital to attend his son, as other physicians would not take charge of the case. This the resident physician refused to do. All of these facts have been elicited before Coroner Ashbridge, and on asking the father, "Why did not the Samaritan Hospital doctors treat the wounded foot?" he was told that he did not know, but was under the impression that medical ethics prevented it being done. At the inquest the coroner stated to the jury "that the question to determine was from which wound the lockjaw had developed, but unfortunately, no autopsy could ever reveal that fact. While the evidence may point to the wounded foot as the cause, we can not determine that." On account of the connection of the resident physician in the case and of his abusive language toward preachers, the coroner censured him quite severely and thought that the hospital should take some action in the matter. The last accounts stated that the resident had resigned.

DR. GUITÉRAS PROSTRATED.—It is reported that owing to the excessive labors forced upon him on account of the campaign in Cuba, Dr. John Guitéras has been prostrated with fever and overwork. He reported 250 cases of yellow fever in the hospital at Siboney on July 16, and up to that time there had only been five deaths from that cause, thus proving the mildness of that disease. In the epidemic of yellow fever last year in the South, Dr. Guitéras also attributed the low death rate to the fact that, owing to a better understanding of that disease and of its symptoms than was formerly the case, many cases were recognized earlier and consequently received appropriate treatment before alarming complications arose, thus reducing the mortality.

BEQUEST.—By the will of Mrs. Eliza H. Frailey, widow of Commodore Frailey of this city, $17,000 has been left to the Hospital of the Protestant Episcopal Church of Philadelphia.

A CASE OF SUSPENDED ANIMATION AT ST. MARY'S HOSPITAL.—On account of the death of his mother, Louis Holyworth, a young man of highly nervous temperament, fell into a state of unconsciousness when he lay in a trance for a period of about forty eight hours.

STAMPING OUT TUBERCULOSIS AMONG CATTLE.—According to the investigations of Dr. Leonard Pearson of Philadelphia, State Veterinarian, tuberculosis in cattle is rapidly disappearing and in many sections of the State the disease is very uncommon. It is stated that the older sections of the State suffered most, from the fact that more cattle were affected and, according to the provisions of the law, these had to be destroyed. About 30,000 cattle have been tested with tuberculin and in a larger number physical examinations have been made, and of these three thousand have been destroyed, thus getting rid of this many foci of infection.

STRANGE BEQUEST TO THE UNIVERSITY OF PENNSYLVANIA.—Edwin P. Kelly, an eccentric tailor who recently died in Philadelphia, inserted a clause in his will providing that after death a sufficient sum of money be set aside for converting his body into a mummy for the benefit of science, and that the same be presented to the University Museum. Owing, however, to the fact that the University would not receive the bequest, and to the fact that decomposition of the body had begun, this provision of the will can not be carried out.

THE PUBLIC SERVICE.

Assignments of Army Medical Officers.—To the 2d Army Corps, General Wm. M. Graham, Camp Alger, Va.: Acting Asst. Surgeons Isaac W. Brewer from Watkins, N. Y.; Frank W. Ross from Elmira, N. Y.; Joseph E. R. Ellis and Fred W. Palmer from Washington, D. C.; John C. Orr from Chambersburg, Pa., Chas. V. Buttler from Norwich, Conn.; John T. H. Slayter from Cambridge, Mass., and Jeremiah E. Leahy from Washington, D. C. To the 3d Army Corps, General James F. Wade, Chickamauga Park, Ga.: Major John P. Dodge, brigade surgeon; Major D. Appel, Surgeon U. S. A., relieved from the 1st division 7th Corps, and the following acting assistant surgeons: John J. Repetti and Clark I. Wertenbaker from Washington, D. C.; Harry E. Getier from Littletown, Pa.; John E. Bacon from Buffalo, N. Y.; John Mason Williams from Louisville, Ky.; H. L. Gilchrist from Cleveland, Ohio; D. R. Dewey from North Adams, Mass.; Chas. F. Craig from Danbury, Conn.; Chas E. V. Kennon from North Easton, Mass., and A. E. Smith from Freeport, Ill. To troops at Tampa, Fla.: Acting Asst. Surgeons Urban S. Bird and Paul T. Dessez from Washington, D. C.; Jos. F. Chmelicek from New York; Geo. H. Fox from Downington, Pa., and Hermann B. Gessner from New Orleans, La. To the 5th Army Corps at Santiago, Cuba, via New York City: Major Lawrence C. Carr, brigade surgeon, and the following acting assistant surgeons: Wm. T. Hamilton from Ironton, Ala.; Jas. T. Persons and H. B. Mohr from Mobile, Ala.; J. M. Newell, Ricardo Gaston, Jos. M. Pena, Clarence S. Perry, Wiley L. Atkey and E. Van Hood, all from Washington, D. C.; W. Edson Apple from Philadelphia, Pa., and John A. Lowner from Boston, Mass. Via Tampa, Fla.: Major Seaton Norman, Surgeon, 3d Volunteer Infantry; Capt. R. S. Woodson, Asst. Surgeon U. S. A., and the following acting assistant surgeons: J. R. Shannon from Washington, D. C.; Randall R. Hunter from Fulton, Kan.; George H. Fonde from Mobile, Ala.; Geo. E. Lawrason from Macon, Ga.: Frank R. Maura from Pensacola, Fla.; Milton Vaughan from Little Rock, Ark., and C. H. Tebault, Jr., from New Orleans, La. To the 7th Army Corps, General Fitzhugh Lee, Jacksonville, Fla.: Major W. S. Bryant, brigade surgeon, late Asst. Surgeon 1st Massachusetts Artillery; Capt. Benjamin Munday, Asst. Surgeon U. S. A., and Acting Asst. Surgeons Slids B. Post and John K. Rainey. To the U. S. general hospital, Ft. McPherson, Ga.: Major Wallace Neff, brigade surgeon, from Cincinnati, Ohio, and Major Wm. J. Wakeman, brigade surgeon, from duty at Camp George H. Thomas, Chickamauga Park, Ga. To the Leiter general hospital, Chickamauga Park, Ga.: Acting Asst. Surgeons Chas. C. Marbury from New York City, Julius Ullman from Buffalo, N. Y., and Thaddeus Walker from Detroit, Mich. To the U. S. general hospital at Ft. Monroe, Va.: Acting Asst. Surgeon John R. Hicks from the steamship *Manitoba*. To the U. S. general hospital, Ft. Myer, Va.: First Lieut. Albert E. Truby, Asst. Surgeon U. S. A., recently appointed, from Otto, N. Y. To the U. S. general hospital at Montauk Point, Long Island, N. Y.: Acting Asst. Surgeon T. G. Holmes from Detroit, Mich.: To the hospital ship *Missouri* at New York City: Capt. Alex. N. Stark, Asst. Surgeon U. S. A. Resigned: Majors Charles E. Ruth and Willis G. McDonald, brigade surgeons, and First. Lieut. R. Mark, Asst. Surgeon, 3d North Carolina Infantry.

CHANGE OF ADDRESS.

Chance, B. K., from 1610 Christian to 118 South 17th Street, Philadelphia, Pa.
Corbell, R. L., from Chuckatuck to Port Norfolk, Va.
Caldwell, W. S., from Freeport, Ill. to Sioux Falls, S. D.
Freeman, B. F., from New Palestine to Ridgeville, Ind.
Goff, J. V., from Tuscon to Ashfork, Ariz.
Hodges, F. J., from Anderson, Ind. to Ashland, Wis.
Holland, J. W., from Holderness, N. H. to care The Checkley, Prouts Neck, Maine.
Zeller, J. O., from Ann Arbor to Skanee, Mich.

LETTERS RECEIVED.

Bremmer, H. A., Merritt, Ill.; Burnett, Swan M. (2) Washington, D. C.; Bruner, W. A., Cleveland, Ohio.
Coley, W. B., New York, N. Y.; Clark, C. F., Columbus, Ohio; Cokenower, J. W., Des Moines, Iowa.
Dewar, J. B., Cedar Springs, Mich.
Egbert, J. Hobart, Holyoke, Mass.; Engels, E. Fletcher, Chicago, Ill.
Fairchild, D. S., Clinton, Iowa.
Gihon, A. L., Sykesville, Md.; Gould, Geo. M., (2) Westfield, N. Y.; Green, C. C., Beaver City, Neb.
Huffman, G. W., Defiance, Ohio; Hall, A. D. Book Binding Co., Appleton, Wis.; Hughes, D. L., Keokuk, Iowa; Harrah, W. S., Washington, D. C.; Harris, Geo. T., Falls of Rough, Ky.
Irving, W. T., Dark's Mills, Tenn.
Johnston, Geo. W. Washington, D. C.
Kreider, Geo. N., Springfield, Ill.; Klepinger, J. C., Union, Ohio; Karger, S., Berlin, Germany.
Labbé, D., Paris, France; Levers, E. E., Red Canon, Wyo.; Link, J. A., Springfield, Ohio.
Moore, C. R., Chicago, Ill.; Moore, J. S., Grant's Pass, Ore.; McIsaac, Isabel, Chicago, Ill.; Murphy, T. C., Manito, Ill.; Marcy, H. O., Boston, Mass.; Millbury, F. S., Brooklyn, N. Y.; Magruder, G. L., Washington, D. C.; Matthews & Swartz, Pine Bluff, Ark.; May, J. M., Meridian, Miss.; Markley, P. L., Rockford, Ill.
Noland, C. C., Rockwell City, Iowa; Norstrow, H., Boone, Iowa; Nichols, H. B., Pulteney, N. Y.; Norwich Pharmacal Co., Norwich, N. Y.
Pynchon, E., Chicago, Ill.; Parker, W. T., Asylum Station, Mass.; Philadelphia Medical Journal, Philadelphia, Pa.; Pease, F. P., Buffalo, N. Y.; Reedy, E. S., Colorado City, Colo.; Raymond, J. H., Brooklyn, N. Y.
Senn, N., New York, N. Y.; Smart, Chas. (2) Washington, D. C.; Smith, W. T., Hanover, N. H.; Seeley, W. K., Dubuque, Iowa; Spalding, J. S., Chicago, Ill.; Stevens, A. M., Ann Arbor, Mich.; Spivak, C. D., (2) Denver, Colo.; Short, J. L. Rolla, Mo.
Thomson, G. K., Halifax, N. S.; Times Publishing Co., Bethlehem, Pa.; Tuley, H. E., Louisville, Ky.; Tyree, J. S., Washington, D. C.
Ward, Montgomery & Co., Chicago, Ill.; Wisman, J. L., Frontier, Mich.; White, F. Elwyn, Pa.; West, H. A., Galveston, Tex.; Wyckoff, R. M., Brooklyn, N. Y.; Wood & Co., Wm., New York, N. Y.; Whitford, W., (2) Chicago, Ill.